NAVI-HARBOUR

(VERSION 3.7)

TECHNICAL MANUAL

© Transas Marine Ltd. February, 2003

© Transas Marine Ltd. 2003
All rights reserved. The information contained herein is proprietary to Transas Marine Ltd. and shall not be duplicated in whole or in part.
The technical details contained in this manual are the best that are available at the date of issue but are subject to change without notice. Transas Marine Ltd. pursues the policy of continuous development. This may lead to the product described in this manual being different from the product delivered after its publication.
Microsoft and Widows are registered trademarks of Microsoft Corporation.
The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

This document contains:

Preamble **9**
1. General Information **13**
1.1 Purpose and Application of the Technical Manual **15**
1.2 Necessary Notes and Warnings **15**
1.3 Contacting Transas **15**
1.4 General Description of the Systems **15**
1.4.1 VTS System Operating Principles 16
1.4.2 Difference between the Navi-Harbour 1000/2000/3000 and Navi-Traffic 18
1.5 Main VTS System Elements **18**
1.5.1 Operator Display Unit 18
1.5.2 Sensors 19
1.5.3 Radar Processors 22
1.5.4 Database Server 25
1.5.5 Interaction between the System Elements 26
1.6 Transas Products **26**
1.6.1 Navi-Harbour Software Package 26
1.6.2 Radar Processing Module RIB2 27
1.6.3 RPB-3 Radar Processing Module 27
1.6.4 BM-E Radar Control Unit (BMECU) 28
1.7 Components from Other Manufactureres **28**
2. Operator Display Unit **29**
2.1 Installation Plan **31**
2.2 General Requirements **32**
2.2.1 ODU Computer Requirements 32
2.2.2 Software Requirements 33
2.3 Requisite Conditions **33**
2.4 Preparatory Operations **34**
2.4.1 Operating System Installation 34
2.4.2 Check of Network Software Adjustment 35
2.4.3 Check of TCP/IP Connection 35
2.5 ODU Installation **36**
2.5.1 Dongle Installation 36
2.5.2 Check of License Disk Integrity 36
2.5.3 Running Setup Program 36
2.5.4 Working with Setup Program 36
2.5.5 Completing Installation on ODU N 37
2.5.6 Adding ODU Program to the Startup Menu 37
2.5.7 Installation of Electronic Charts 37
2.5.8 Checking Installation Results 38
2.6 Record Server **39**
2.6.1 Record Server Program Installation 39
2.6.2 Record Server Program Running Options 39
2.6.3 Editing NHRecServ.ini Configuration File 39
2.7 Running ODU **39**

2.8 General System Settings 40
2.8.1 Creating a VTS Configuration 40
2.8.2 Setting of ODU/OS Configuration 41
2.8.3 Operator List 42
2.8.4 Setting the Alarms by Default 43
2.8.5 System Security 44
2.8.6 Creating VTS Chart Objects 48
2.8.7 Setting of Sensor Configuration 50
2.8.8 Record Server Configuration 52
2.8.9 Network Configuration 52
2.9 Individual ODU Settings 53
2.9.1 Setting the Chart Display Options 54
2.9.2 Loading Electronic Charts 55
2.9.3 Creating Modifiable Charts 56
2.9.4 Setting the Range of Displayed Chart Information 56
2.9.5 Configuring the Desktop 58
2.9.6 To Set the Message Acknowledgement and Indication Options 59
2.9.7 To Set the Parameters of Sound Warning 60
2.9.8 Setting the Fonts 60
2.9.9 Setting Radar Image Colours 60
2.9.10 Setting the Printing Options 61
2.9.11 The Use of Intellimouse Capabilities 61
2.9.12 Alternative Datum 62
2.9.13 Check of the Navi-Harbour System Operation 63
2.9.14 Getting Information on the Program 64
2.9.15 User Chart File Format 64
2.9.16 Controlling the Logging Procedure 64
2.9.17 Setting VTS Operation Mode 70
2.9.18 Operating System Automatic Reboot 70
2.9.19 Printer Recommended Settings 71
2.10 Configuring Playback ODU 72
2.10.1 Running Playback ODU 72
2.10.2 Initial Run of Playback ODU 72
2.10.3 Playback Panel 73
2.10.4 To Select the Playback Source 73
2.10.5 List of Current Playback Tracks 74
2.10.6 Selecting Tracks for Playback 74
2.11 Setting of Synchronization 75
2.11.1 General Approach to Building up of the Time Synchronising System 75
2.11.2 Time Synchronising System Software 75
2.12 Finishing Work on ODU Computer 76
2.13 System Backup 76
2.13.1 Saving of System Configuration 77
2.14 ODU Re-installation 78
2.14.1 Reconstruction of a Configuration from a File 79
2.14.2 License Re-installation 80

3. Radar Processor ORS3 81
3.1 General 83
3.2 Generalised Structure of ORS3 Radar Processor 83
3.3 Computer and OS Requirements 84
3.3.1 ORS3 Computer 84
3.3.2 Operating System Installation 84
3.4 Installation of ORS3 Hardware 86
3.4.1 Assigning of ORS Computer Resources 86
3.4.2 RPB3 Board Adjustment 86
3.4.3 RPB3 Card Installation 86
3.5 ORS3 Software Installation 87
3.5.1 List of ORS3 Software Modules 87
3.5.2 ORS Server Program Installation 87
3.5.3 RPB3 Driver Installation 88
3.5.4 VARP31 Program Installation 89
3.5.5 Installation of Integrator2 Program at ODU 0 89
3.6 RPB3 Operation Check 89
3.7 ORS3 Software Component Settings 90
3.7.1 ORS Server Program Adjustment 90
3.7.2 Adjustment of Main Radar Processing Parameters 93
3.8 ODU0 Setting for the Operation with ORS3 94
3.8.1 Installation of Target Manager Program 94
3.8.2 Creating Transas Target Manager Type Sensor 95
3.8.3 Adjustment of Nharb0.ini file for the Work with Target Manager 95
3.8.4 Creating ORS-3 Type Sensor 95
3.9 Connection of ORS3 to the Radar 96
3.9.1 List of Compatible Radars 96
3.9.2 Connecting Radar Analog Signals 97
3.9.3 Connection of Control Channels for Master Mode 97
3.9.4 Additional Signals for Slave Mode 97
3.10 First Run 98
3.10.1 Running the Programs 98
3.10.2 Switching the System to “Function” Mode 98
3.10.3 Switching Target Tracking off 99
3.10.4 Turning the Radar on 99
3.10.5 System Operation Check 99
3.11 Radar Picture Adjustment 99
3.12 Input of Blanking Sectors 100
3.13 Creation of Sensor Individual Chart 101
3.13.1 No Tracking Area 101
3.13.2 Video Masking Areas 102
3.13.3 Tracks Saving Area 102
3.13.4 Target Routes 102
3.13.5 Adjustment of Waiting Time before the Arrival of Video Data 103
3.13.6 ORS-3 Target Acquisition Criterion 103

3.14 Optimising ORS-3 settings 103
3.14.1 Noise Level and Min Sensitivity Parameter Measurements 103
3.14.2 Anti-rain Shift Measurements 104
3.14.3 Reference Gain Measurement 104
3.14.4 SLR Adjustment 105
3.14.5 ACF Adjustment 106
3.15 Adjustment of the Automatic Sensitivity Control System 107
3.15.1 Setting of False Detection Density 107
3.15.2 Setting of the Minimum Threshold in a Segment 108
3.15.3 Setting of Linked Threshold 110
3.15.4 Setting of Related Threshold 110
3.16 Segment Grouping 111
3.17 Troubleshooting 112
3.18 VARP31 Diagnostic Message Codes 113
3.19 Radar Status Diagnostics Panel 114
3.20 Remote Start of RP Computer 115
4. ORS-2 Radar Processor 117
4.1 General 119
4.2 Generalised ORS2 RP Structure 119
4.3 Computer and OS Requirements 120
4.3.1 ORS2 Computer 120
4.3.2 Operating System Installation 120
4.4 Installation of ORS2 Hardware 122
4.5 Installation of ORS2 Software 122
4.5.1 List of ORS2 Software Modules 122
4.5.2 ORS Server Program Installation 122
4.5.3 RIB2 Driver Installation 124
4.6 ORS2 Software Component Setup 124
4.6.1 ORS Server Program Setup 124
4.6.2 Configuring of Radar Processing 126
4.7 Adjustment ODU for Operation with ORS2 127
4.7.1 Creating Transas ORS-2 Type Sensor 127
4.8 ORS2 Connection to the Radar 129
4.8.1 List of Compatible Radars 129
4.8.2 Connection of Radar Analog Signals 129
4.8.3 Connection of Control Channel for Master Mode 130
4.8.4 Additional Signals for Slave Mode 130
4.9 First Run 130
4.9.1 Running the Programs 130
4.9.2 Switching the System to “Function” Mode 130
4.9.3 Turning the Radar on 131
4.9.4 System Operation Check 131
4.10 Radar Picture Adjustment 131
4.11 Input of Blanking Sectors 132
4.12 Transas ORS-2 Individual Chart 133
4.12.1 Radar Zones 133
4.12.2 Video Masking Zones 133

4.13 Configuring of Radar Processing Parameters 134
4.13.1 Input of Scanning Area Parameters 134
4.13.2 Selection of the Primary Processing Parameters 136
4.13.3 Automatic Adjustment of Thresholds by Spots 137
4.14 Tracking Quality Adjustment 138
4.15 Adjustment of Waiting Time before the Arrival of Video Data . 138
4.16 Radar Status Diagnostics Panel 139
4.17 Remote Restart of RP Computer 140
5. UAIS Transponder 141
5.1 Connection and Adjustment of Operation with AIS Transponders 143
5.1.1 List of Compatible Base AIS Transponders 143
5.1.2 Equipment Requirements 143
5.1.3 Preparation for the Installation 143
5.1.4 Connection of UAIS Transponders 143
5.1.5 Installation of AIS Server Program 143
5.1.6 Adjustment of Sychronising with UTC Time 144
5.1.7 Setup of AIS Server Program 144
5.1.8 Adjustment of ODU 0 for Operation with UAIS Transponders 145
5.2 First Run and Operation Check 147
5.2.1 Check of Software Component Start 147
5.2.2 Turning on of Transponder Power Supply 147
5.2.3 Check of Transponder Connection 147
5.2.4 Check of Synchronising with UTC Time 147
5.2.5 AIS Transponder Status Diagnostics Panel 148
6. Audio Information Server 149
6.1 General 151
6.2 Computer and OS Requirements 151
6.2.1 AUdio Information Server Computer 151
6.2.2 Operating System Installation 151
6.3 Hardware Installation 153
6.3.1 Types of Sound Digitising Cards in Use 153
6.3.2 Installation of Delta 44 and Sound Blaster Cards 153
6.3.3 Installation of Olkha 24M Cards 153
6.4 Software Installation 155
6.4.1 List of Audio Information Server Software Modules 155
6.4.2 Installation of Sound Server Program 155
6.4.3 Installation of Sound Digitising Card Drivers 155
6.4.4 Installation of Aldertst program 155
6.4.5 Time Synchronising Component Installation 156
6.5 Adjustment of Signal Levels 156
6.5.1 For Delta 44 Cards 156
6.5.2 For Sound Blaster Cards 156
6.5.3 For Olkha 24M Cards 156
6.6 Adjustment of Sound Server Program 157
6.6.1 Operating System Automatic Reboot 157
6.6.2 Adjustment of Audio Information Channels 157

6.7 Adjustment of ODU for Operation with Sound Server 160
6.7.1 Creating an Audio Type Sensor 160
6.7.2 Selection of Audio Channels for Playback 160
6.8 Audio Sensor Status Diagnostics Panel 161
6.9 Generation of Audio Recorder Alarms 161
6.10 Adjustment of the Recording Level 161
7. Video Surveillance System 163
7.1 List of Compatible Equipment 165
7.2 Connection of CCTV Cameras and Adjustment of Operation with Them 165
7.2.1 Creating of VTS Chart Object 165
7.2.2 Creating of CCTV Controllers Sensor 165
7.3 Video Surveillance System Diagnostics 167
7.3.1 Video Surveillance System Diagnostics Panel 167
7.3.2 Diagnostics in System Status Window 167
8. VHF Direction Finder 169
8.1 List of Compatible Direction Finders 171
8.2 Modes of Operation with Direction Finders 171
8.3 VTS Connection Options 171
8.4 Equipment Requirements 172
8.4.1 Preparation for the Installation 172
8.4.2 Connection of Direction Finders 172
8.5 Configuring ODU 0 for the Operation with Direction Finders 172
8.5.1 Creating Direction Finder Type Sensor 172
8.5.2 Parameters of Direction Finder Type Sensor 172
8.5.3 Direction Finder Status Diagnostics Panel 173
8.6 Diagnostics of Direction Finders Condition in the System Status Window 173
9. Radar ARPA 175
9.1 List of Compatible Radars in ARPA Mode 177
9.2 Preparation for the Installation 177
9.3 VTS Connection Options 177
9.4 Connection to BridgeMaster ARPA 178
9.4.1 Equipment Requirements 178
9.4.2 Supported Protocols 178
9.4.3 Compass Connection 178
9.4.4 Connection to the VTS System Computer 179
9.4.5 Configuring BridgeMaster ARPA 180
9.5 Connection to Sperry Rascar 3400 ARPA 181
9.5.1 Equipment Requirements 181
9.5.2 Supported Protocols 181
9.5.3 Connection to the VTS System Computer 181
9.5.4 Configuring of Sperry Rascar 3400 ARPA 181
9.6 Connection to ATLAS 8600 ARPA 182
9.6.1 Equipment Requirements 182
9.6.2 Supported Protocols 182
9.6.3 Connection to the VTS Computer 182

9.7 Configuring ODU 0 for Operation with ARPA Radars 183
9.7.1 Creating of “Radars” Object 183
9.7.2 Creating an ARPA Sensor 183
9.7.3 Parameters of ARPA Type Sensor 183
10. Other VTS Systems 185
10.1 Connection and Adjustment of Operation with other VTS Systems 187
11. Hydro-Meteo Stations 189
11.1 List of Compatible Hydro-Meteo Stations 191
11.2 Data Components 191
11.3 VTS Connection Options 191
11.4 Adjustment of ODU 0 for Operation with Hydro-Meteo Station 191
11.5 Hydro-Meteo Stations Status Diagnostics Panel 192
12. Network Planning 193
12.1 General Information 195
12.2 Data Streams in the VTS Network 196
12.2.1 Sources of Information 196
12.2.2 Users of Information 197
12.3 Use of Proxies for Outgoing Connections 198
12.3.1 Necessity to Introduce a Proxy in a Subnet 198
12.3.2 Selection of a Computer 198
12.3.3 Data Transfer Diagram 198
12.4 Network Configuration 199
12.4.1 Editing of the Network Configuration 199
12.5 Check of the Routing Correctness 200
12.5.1 Checks for Users 200
12.5.2 Checks for the Proxies 201
12.6 Proxy Connection Diagnostics 202
13. Service Navi-Harbour Software 203
13.1 Commux Program 205
13.1.1 Purpose 205
13.1.2 COMMUX Program Installation 205
13.1.3 Commux Program Adjustment 205
13.1.4 Adding Commux Program to the Startup Menu 206
13.2 Stand-alone Proxy Program 207
13.2.1 Preparatory Operations 207
13.2.2 Program Installation 207
13.2.3 Program Adjustment 207
13.2.4 Diagnostic Panels 207
13.3 Radar Maintenance Monitor Program 208
13.3.1 Introduction 208
13.3.2 Running Maintenance Monitor 208
13.3.3 Configuring Maintenance Monitor 208
13.3.4 Configuration File Editing 209
13.3.5 Control of the Radar and Radar Processor 210
13.3.6 Control of the Radar Image Display 211
13.3.7 Joint Operation with the Control Centre 211
13.3.8 Problems which May Occur During the MM Start 211

14. VTS Remote Terminal 213
14.1 General Information 215
14.2 Dongle Installation 216
14.3 Remote Terminal Software Installation 216
14.3.1 Running Setup Program 216
14.3.2 Working with Setup Program 216
14.4 Playback of the Recorded Information 216
15. Troubleshooting 217
Annex 1 221
Annex 2 225

PREAMBLE

This chapter provides general information for the work with this document.

Copyright Transas Marine Ltd., 2003

This document provides general description of the TRANSAS Navi-Harbour 1000, Navi-Harbour 2000, Navi-Harbour 3000 and Navi-Traffic vessel traffic services (VTS) systems, description of the procedures to install, run, adjust and troubleshoot these systems, and TRANSAS warranties. In addition, this document sets forth requirements to the third party suppliers' hardware and software used in the systems. It specifies rules for the installation of various VTS system components and adjustment of VTS functions.

PRINTING HOUSE CONVENTIONS

Sample of an entry	Comments on the use
OPERATOR DISPLAY UNIT. USER MANUAL.	To highlight, in a printed document, names of other documents which the current document contains references to
Menu Operations	To highlight, in a printed document, names of this document sections
ODU\CONFIGURATION\SAVE	To highlight, in a printed document, menu items mentioned in this document
<Enter>	To highlight, in a printed document, names of keyboard keys
"Next"	To highlight, in a printed document, names (of a window, page, tab, button, etc.)
`NharbN.ini`	To highlight messages, commands, files and other Windows OS information

DATA REQUIRED FOR HANDLING THIS DESCRIPTION

The description is divided into seventeen parts:

Chapter 1 Introduction.

Chapter 2 Operator Display Unit.

Chapter 3 Radar Processor ORS3.

Chapter 4 ORS-2 Radar Processor.

Chapter 5 UAIS Transponder.

Chapter 6 Audio Information Server.

Chapter 7 Video Surveillance System.

Chapter 8 VHF Direction Finder.

Chapter 9 Radar ARPA.

Chapter 10 Other VTS Systems

Chapter 11 Hydro-Meteo Stations.

Chapter 12 Network Planning.

Chapter 13 Service Navi-Harbour Software.

Chapter 14 VTS Remote Terminal.

Chapter 15 Troubleshooting.

Annex 1 Work with Chart Manager Program.

Annex 2 Contacting TRANSAS.

CHAPTER 1

General Information

This chapter provides general description of the systems, main VTS system elements and components from other manufactures.

Copyright Transas Marine Ltd., 2003

1.1 PURPOSE AND APPLICATION OF THE TECHNICAL MANUAL

This document describes standard configurations of the Navi-Harbour 1000, Navi-Harbour 2000, Navi-Harbour 3000 and Navi-Traffic VTS systems.

The document is supplied to the customer as part of the VTS system operating documentation.

All the information contained in this document refers exclusively to the VTS system based on the Navi-Harbour version 3.7 software.

1.2 NECESSARY NOTES AND WARNINGS

Depending on the selected configuration, the VTS system may include:

- electronic components (computers, monitors, modems);
- transmitting components (transponders, radars);
- mechanical components (rotating radar antenna units), which may be hazadous to human health and life. Before starting the installation of the equipment, it is, therefore, necessary to carefully read the safety precautions sections included in the associated documentation for each type of the equipment.

1.3 CONTACTING TRANSAS

To order a standard VTS configuration and to select an optimum VTS configuration, contact TRANSAS representative at one of the addresses specified in **Annex 2**. With all kinds of propositions on the improvement and extension of functions in the already operating VTS systems as well as with information on the malfunctions identified in the process of the system operation, please contact the same addresses.

1.4 GENERAL DESCRIPTION OF THE SYSTEMS

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems are up-to-date high-tech automatic systems aimed at enhancing the safety and efficiency of navigation, safety of human life at sea and environmental protection from the possible adverse effects of shipping.

These VTS systems provide the user with various navigational information in the way of the decision making support. The systems enable the ships and other navigational objects in the off-coast areas to be identified and tracked, vessel traffic to be planned.

Navi-Harbour 1000/2000/3000, Navi-Traffic VTS systems are integrated networked computer systems based on the following principles:

- open architecture;
- modular system structure;
- use, predominantly, of the widely employed standard hard- and software;
- minimum use of the dedicated equipment;
- favouring of software solutions over the hardware methods;
- digital processing of data from all the system sensors, including analog sensors;

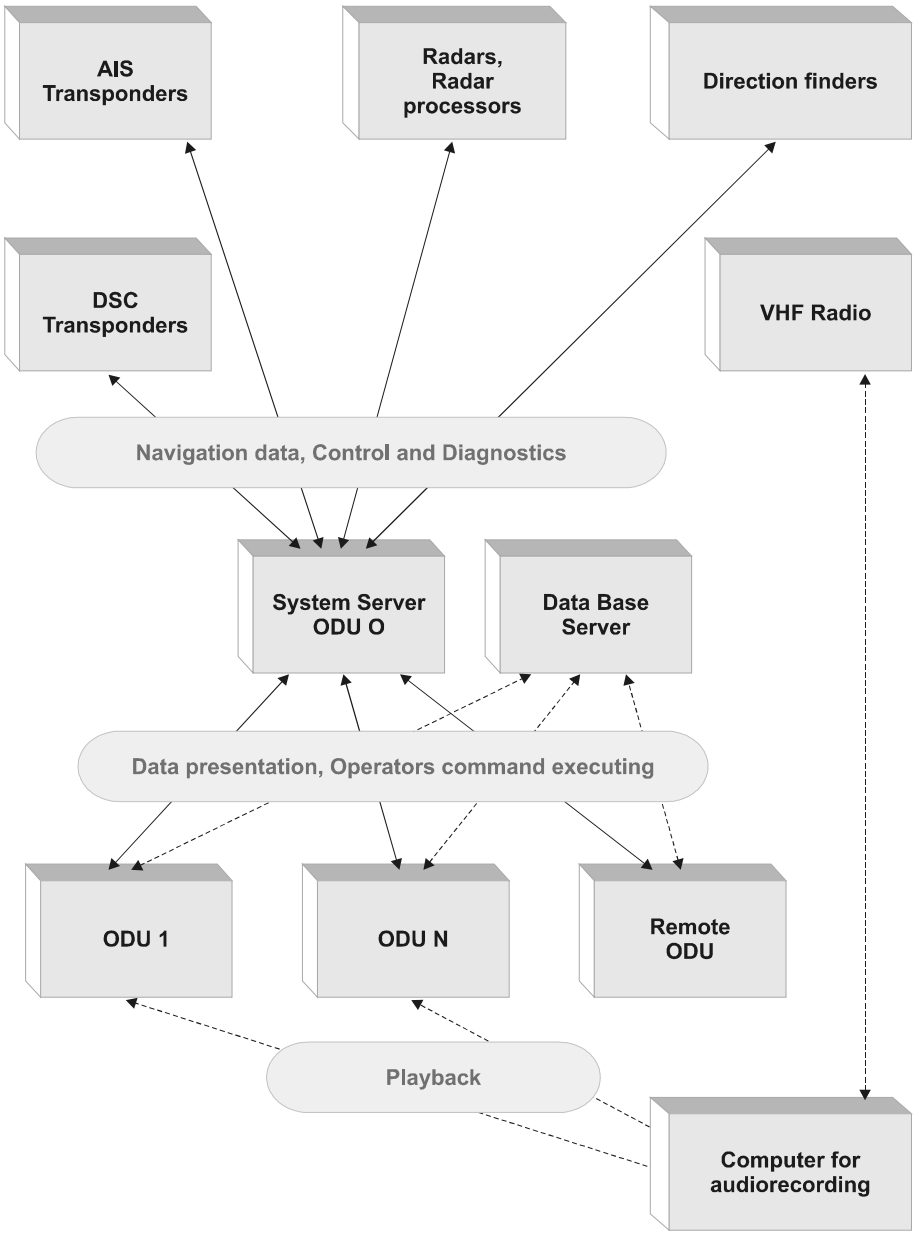
- use of the most recently developed mathematical methods for the processing of the radar data; use of unique algorithms for the target extraction and tracking;
- possibility to use remote VTS sensor sites;
- use of standard digital systems, data transmission protocols;
- centralised processing and correction of the target data from many sources;
- automatic identification of most of the possible dangerous situation and generation of appropriate alarms;
- display of various data to operators in the most user-friendly computer form with an intuitively clear interface;
- use of computer marine cartography facilities for a better presentation of navigational and other data;
- recording, storage, archiving of most of the data (targets' motion, transmitted messages, radar image of the area, exchange between the operators, etc.) for the further full playback of the situation dynamics within the selected period of time;
- support and use of a powerful VTS information system, capability to interact with other databases;
- capability of the VTS system to be connected to remote terminals;
- several levels of access rights and VTS controls for the operators;
- capability to expand the systems at no additional cost of renovating the already installed components.

1.4.1 VTS System Operating Principles

The VTS system operating principle consists in:

- reception of information on the navigational situation from the external sources referred to as SENSORS;
- generalising of the target data;
- presentation of the target data in the Target Table;
- presentation of graphic target data in combination with the multi-layer electronic charts of the area;
- analysis of the navigational situation and generation of alarms and warnings according to the criteria set by the operator;
- output of various auxiliary navigational and other information;
- digital recording of the navigational situation data for the further playback.

A block diagram of the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS system functioning is provided in the drawing below.



1.4.2 Difference between the Navi-Harbour 1000/2000/3000 and Navi-Traffic

Navi-Harbour 1000, Navi-Harbour 2000 and Navi-Harbour 3000 VTS systems are the most common among the small VTS systems produced by TRANSAS. These VTS systems include a single radar and, maybe, direction finders and AIS transponders. Models of Navi-Harbour VTS systems differ in the way they interact with the radar:

- Navi-Harbour 1000 system is connected to the ARPA only, and receives from it the information on the tracked radar targets;
- Navi-Harbour 2000 system is connected to the radars in the slave mode only, the VTS system receiving and processing radar signals. The radar console functions in an ordinary mode, it is from here that all the radar control and diagnostics are effected;
- Navi-Harbour 3000 fully replaces the radar console, the VTS system both, processing the radar signals and providing control and diagnostics of the connected radar.

Navi-Traffic VTS systems are systems including two and more radars.

1.5 MAIN VTS SYSTEM ELEMENTS

The main elements of the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems are:

- Operator Display Units;
- Sensors;
- Radar processors;
- Database server;
- Data transmission network.

1.5.1 Operator Display Unit

General Description

A workplace of one VTS operator is called the OPERATOR STATION. The Operator Station normally consists of one or several OPERATOR DISPLAY UNITS. It may also include radio exchange facilities, telephone and a console to place the equipment.

The OPERATOR DISPLAY UNIT (ODU) is one of the main VTS system elements which provides the operator, in an interactive mode, with all kinds of graphic, test and acoustic system data. The ODU is also the main operator's tool for the control and diagnostics of the VTS system as a whole and some of its separate parts. The ODU concentrates in itself all the functions required for the operator's communication with the system.

The OPERATOR DISPLAY UNITS consists of a high performance computer based on one or two PENTIUM processors, operating under Microsoft Windows 2000, high resolution video system with one or two 29" displays, computer keyboard, a mouse or a trackball and, normally, an acoustic system.

All the VTS Operator Display Units have numbers. Therefore, each ODU in the system has a name: ODU 0, ODU 1, etc.

System Server/ODU 0

A requisite functioning component of the system is ODU 0, which performs functions of a SYSTEM SERVER. ODU 0 concentrates and processes information from all the system's sensors and distributes the display of this information among different operator modules. ODU 0, like any other ODU, can be used for the standard operator work: it may display navigational situation, execute various commands.

If the VTS system uses a large number of sensors, the processing of sensor information requires a greater computing power of ODU 0. In such systems the operators do not do any routine works on ODU 0, enabling all the ODU 0 resources to be used for the server tasks. In systems like this, ODU 0 is a dedicated VTS system server.

ODU N

Along with ODU 0, other operator modules, referred to in what follows as ODU N, may function in the VTS system, performing the functions of the interface between the operators and the VTS system. The only difference between ODU N and ODU 0 consists in that there are no server components in the ODU N executable software.

Playback ODU

PLAYBACK ODU is a software module. Its purpose is to reproduce navigational situation in the ODU's normal graphic environment from the recordings made by the system earlier.

PLAYBACK ODU program can be executed on any powerful enough VTS system computer, e.g, on ODU 0 or ODU N. PLAYBACK ODU program can be executed concurrently with the ODU 0/N software operating in the standard mode. In most of the VTS systems, the Playback ODU may be implemented on a dedicated VTS technical support computer.

1.5.2 Sensors

Sensors are the main source of information on the navigational situation for the VTS system and, accordingly, for the VTS operators.

The VTS system automatically receives information from sensors, processes it and presents to the operator. Besides, this system controls adjustable parameters and operating modes of most of the sensors, performs diagnostics and displays the sensor status to the operator.

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS system feature a capability to be connected to, process and display information from the following sensor types:

- Radars;
- Direction finders;
- Automatic Information System (AIS) transponders;
- Another VTS system;
- Radio and telephone stations;
- Hydro-meteo stations;
- CCTV Camera.

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems can include a radio traffic registration module.

In Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS system any analog sensor data is converted to the digital format, and it is only then that it is transmitted for the further processing and display to the operator.

VTS Radars

Traditionally, the principal sources of information on the current navigational situation are radars. Navi-Harbour 2000/3000 and Navi-Traffic VTS systems have the following capabilities:

- to receive radar data;
- to automatically, or at the operator's command, acquire and track targets on the basis of radar data;
- to provide the operator with information on the tracked targets and the radar image of the area;
- to save for the further playback the entire radar information including tracks, targets' motion characteristics and radar image of the area.

Navi-Harbour 1000 VTS system has the following capabilities:

- to receive data on the radar tracked targets and display it to present it to the operator;
- to save for the further playback the entire information on the tracked targets.

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems may use various radars depending on the customer's requirements. TRANSAS produces and delivers the radar data processing equipment (radar processors) and software for these processors.

Radars of various types can be connected to the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems in the three principal modes:

- ARPA mode;
- WITHOUT CONTROL mode;
- WITH CONTROL mode.

In ARPA mode, the Navi-Harbour system can only be connected to the radars which have a capability to transmit information on the radar tracked targets in NMEA-0183 format. In this mode, the VTS system processes and presents to the operator the data on targets received from the radar. The entire control and diagnostics are effected from the radar's own display. TRANSAS VTS system connected to a single radar in ARPA mode is called Navi-Harbour 1000.

In WITHOUT CONTROL mode, the Navi-Harbour system can be connected to the radars, which have addition signal outputs for the connection of external equipment. In this case, the radar processor is connected to these outputs and performs analog/digital conversion of radar signals, their primary digital processing, and transmits radar data to the VTS server for the further processing. Like in the ARPA mode, the entire radar control and diagnostics are effected from the radar's own console. TRANSAS VTS system connected to a single radar in WITHOUT CONTROL mode is called Navi-Harbour 2000.

In WITH CONTROL mode, the Navi-Harbour system fully replaces the radar display. Connected to the radar instead of a console is the radar processor which performs the digital converting, processing and transmission of the radar signals. In addition, the radar processor relays the commands and the radar control and diagnostics messages from the operator stations to the radar equipment and the other way round. TRANSAS VTS system connected to a single radar in WITH CONTROL mode is called Navi-Harbour 3000.

TRANSAS VTS system connected to TWO and MORE radars is called Navi-Traffic.

VTS Direction Finders

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems have the following capabilities:

- to receive data from the direction finders;
- to provide the operator with information on the detected radio transmitters;
- to save all the information received from the direction finders for the further playback.

In Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems, each direction finder is connected to any of the VTS system computers via a serial digital interface. E.g, a direction finder can be connected to the ODU or to the radar processor. Data from each direction finder is passed to the Operator Display Units for the processing and presentation to the operators.

Base Transponders of the Automatic Information System (AIS)

Connected to the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems can be the following base transponders of the Automatic Information System (AIS).

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems have the following capabilities:

- to receive data from the AIS transponders;
- to present to the operator all the ship information available via the AIS;
- to save all the information received from the AIS transponders for the further playback;
- to transmit and receive text telegrams to/from the ships via the AIS;
- to save all the text telegrams transmitted and received via the AIS for the further playback.

In the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems, each base AIS transponder is connected to any of the VTS system computers via the serial digital interface. E.g, the base AIS transponder can be connected to the ODU or to the radar processor. Data from each base AIS transponder including the received text telegrams, is passed to the ODU's for the processing and presentation to the operators. The sent text telegrams are passed from the operator modules to the AIS transponders.

Other VTS Systems

A source of data on navigational situation may be represented by another VTS system connected to the Navi-Harbour 1000/2000/3000 or Navi-Traffic via a data link.

In the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems, the data link from another VTS system can be connected to any of the VTS system computers via the serial digital interface. The data received from another VTS system is transmitted to the Operator Display Units for the processing and presentation to the operators.

Recording of Voice Exchange

Any Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems may include a facility for the recording of the operator exchange. With this aim in view, the system is fitted out with the audio signal digitising equipment. The radio or telephone station which has acoustic signal line outputs can be connected to the VTS system and thus used as sensors for the recording of exchange between the operators. The recorded traffic can be played back synchronously with the playback of other navigation data.

1.5.3 Radar Processors

Purpose of Radar Processors

The radar processors of Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems are called the ORS (Open Radar Supervisor) and are designed for:

- conversion of output analog signals of radar transceivers to the digital form;
- processing of the digitised radar data flow in order to suppress natural and industrial clutter;
- formation of a digital radar image of the monitored area;
- automatic target tracking;
- transmission of the radar image and tracked target data to the VTS system server and Operator Modules;
- display of the radar image and extracted target marks on the radar processor monitor;
- control of processes of clutter suppression, radar image formation and target tracking at the operator commands entered both, from the operator modules and from the radar processor console;
- performance of the radar blanking function (in Navi-Harbour 3000 only);
- control of the radar at the operator commands entered both, from the operator modules and from the radar processor console (in Navi-Harbour 3000 only);
- radar sensor diagnostics and display of messages about malfunctions on the operator modules (in Navi-Harbour 3000 only).

The radar processor is not installed for the processing of data from the radars connected in the ARPA mode.

Radar Processor Installation Site

The radar processor is installed in the immediate vicinity of the radar installation site. The distance between the radar transceivers and the radar processors should not, as a rule, exceed 50 metres.

Components and Structure of ORS Radar Processors

ORS radar processors represent industrial or office PC compatible computers with special radar signal processing modules installed into them. These modules implement functions of the on-line analog/digital conversion and processing of high frequency signals.

ORS radar processor equipment consists of the following components:

- powerful computer based on one or two PENTIUM III processors;
- innovative ORS radar processing board which has an interface with the central processor's PCI or ISA bus;
- optionally, additional external radar signal converters.

ORS-2 radar processor software is comprised of:

- Microsoft Windows 2000 Service Pack 2 English/US version;
- Unique radar processor software.

Radar Processor Types used in the System

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems support the use of the following radar processor types:

- TRANSAS ORS-2;
- TRANSAS ORS-3.

ORS-2 Radar Processor

ORS-2 radar processor is a powerful industrial or office computer based on one or two PENTIUM III processors with the radar processor module, called RADAR INTEGRATOR, built into it.

The radar processor is designed for the radar data processing, control and diagnostics of a single radar.

Radar Integrator

The Radar Integrator is a soft- and hardware module developed for the reception of analog radar signals and their digital processing.

The Radar Integrator consists of:

- Short printed card (120 mm) which has connectors for the connection of radar signals and an interface with the PCI bus of the radar processor computer;
- Two additional (high frequency and low frequency) external signal converters;
- ORS-2 radar processor software (except the operating systems).

The delivery set also includes appropriate operating documentation.

The Radar Integrator performs the following radar processor functions:

- reception of radar signals:
  - analog/digital conversion of the radar signals;
  - suppression of sea clutter, asynchronous and other random interference.

- selection of radar targets:
  - detection of radar echoes with an adaptive threshold;
  - selection of objects by size from a set range of values;
  - determining of target's gravity centre and coordinates;
  - scan-to-scan correlation and smoothing out of targets' coordinates;
  - recording of moments when contact with a target is lost.
- formation of the area's radar image:
  - synthesis of a digital radar picture, improvement of surface situation and coastline presentation (contrasting, filtering and clutter suppression);
  - compensation for non-uniformity of antenna revolutions: "justification" of the radar picture by azimuth;
  - scan-to-scan correlation of primary radar pictures or their selected fragments to enable the target extraction or viewing.
- conversion of the control commands and diagnostics data.

Radar Integrator's Principal Technical Parameters

Maximum frequency of the video signal quantization	40 MHz
Number of analog/digital converter digits	12
Number of elements in range (per radius)	650-2048[1]
Number of elements in bearing	1024
Number of digits in output video signal	8
Bus type	PCI

ORS-3 Radar Processor

ORS-3 radar processor is a computer based on PENTIUM III processor, an industrial or office version, with the built in radar processing module.

The delivery set of the radar processing module includes the following components:

- printed circuit card with connectors for the radar signals and an interface with the radar processor computer ISA or PCI bus;
- ORS-3 radar processor software (except OS);
- operating manuals;
- interface cables and connectors;
- optionally, the delivery may include the radar interface and control devices.

[1] – depending on the radar processor computer capacity.

The radar processing module performs the following radar processor functions:

- reception and filtering of radar signals:
  - reception of radar signals, analog/digital conversion of the video signal;
  - filtering of the video signal by the adjustable low frequency and high frequency filters;
  - package scan-to-scan correlation of the video signal for the clutter suppression;
- detection and tracking of targets:
  - detection of echoes with an adaptive threshold, with a manual or automatic parameters adjustment in the 29 circular zones divided into 32 segments each;
  - automatic stabilising of the false alarm probability;
  - structural analysis of the radar image to determine the position of the geometric centre;
  - automatic acquisition and tracking of targets. Detection, acquisition and tracking may be prohibited as required within any areas limited with polygons;
  - assessment of the ship's speed and course;
  - recording of moments when the contact with a target is lost.

Principal Technical Parameters of the Radar Processing Module

Maximum frequency of the video signal quantization	40 MHz
Number of analog/digital converter digits	10
Number of elements in range (per radius)	Up to 16384
Number of elements in bearing	Up to 16000
Number of digits in output video signal	16
Number of targets tracked simultaneously	500
Bus type	ISA, PCI

1.5.4 Database Server

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems may include integrated information system (IS) enabling the input, storage, easy search and printing out of data on various kinds of objects monitored by the VTS system, like ships, ship calls, anchorage, etc. When a ship appears in the VTS responsibility area, it can be identified as the one already contained in the database, in which case all the stored ship information will be associated with the VTS target in question. There may be automatic identification of the ship by the MMSI number as well as the automatic recording of the ship call data in the VTS information system.

A single data storage and processing centre, called the DATABASE SERVER, is installed for the VTS information system. Notwithstanding the centralised storage, access to the data and control of the information system can be simultaneously effected from any Operator Display Units and VTS system server at the customer's option.

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS information system can be installed in one of the following configurations:

- LIGHT information system configuration;
- NETWORKED information system configuration.

The LIGHT IS configuration is installed for small VTS system. In the light configuration the database server is integrated in one of the Operator stations or in the VTS system server. Installed on such database server is the special Microsoft SQL Server Desktop Edition or Microsoft Office 2000 Database Engine software. Access to and control of the information system both, in the LIGHT and NETWORKED configuration, can be effected from any operator unit of the VTS system server.

NETWORKED IS configuration is installed for a large much used VTS information system. The networked configuration requires an individual computer and fully functional Microsoft SQL Server 7.0 software.

1.5.5 Interaction between the System Elements

All the aforementioned VTS elements interact with each other via the digital data links in accordance with TCP/IP protocol only.

1.6 TRANSAS PRODUCTS

1.6.1 Navi-Harbour Software Package

Navi-Harbour version 3.7 product is the principal part of the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS software. Navi-Harbour software product is fully manufactured by TRANSAS and performs all the problem oriented VTS functions.

Delivery Requirements

Labelling and Packing

The Navi-Harbour software product is delivered in a TRANSAS software packing box made of foam plastic. The box is placed in a multi-coloured cardboard cover. Located within, in separate containers, are the installation CD and a diskette with the software and license, as well as the documentation brochures.

Transportation and Storage

Neither the whole box with the software, nor the casing with the CD and license, should be exposed to the strong mechanical, heat or electromagnetic action. The box as a whole and its content should be stored away from the moisture. Neither the CD nor the diskette should be exposed to the direct sunrays.

Product Delivery Set

The Navi-Harbour version 3.7 software product delivery set includes:

- Navi-Harbour software product installation CD;
- Diskette with a license (licenses) for the installation of the Navi-Harbour 3.7 software.

Note: license files may be delivered both, on a separate diskettes and on the Navi-Harbour software installation CD.

- **NAVI-HARBOUR VERSION 3.7. TECHNICAL MANUAL** brochure;
- **OPERATOR DISPLAY UNIT. USER MANUAL** brochure;
- **VTS INFORMATION SYSTEM. USER MANUAL** brochure (if the database is ordered);
- **VTS INFORMATION SYSTEM. INSTALLATION AND SETUP MANUAL** brochure (if the database is ordered).

1.6.2 Radar Processing Module RIB2

RIB2 is the principal hardware component of ORS-2 radar processor. The Radar Integrator consists of a printed card, high frequency and low frequency converters and is provided with appropriate documentation. RIB2 is fully manufactured by TRANSAS.

Delivery Requirements

Labelling and Packing

RIB2 is delivered in a standard TRANSAS software packing box made of foam plastic. The box is placed in a multi-coloured cardboard cover. Located within, in a special wrapping are the printed card, signal converters and documentation.

Transportation and Storage

Neither the whole box with RIB2, nor the printed circuit card and the frequency signal converters separately, should be exposed to the strong mechanical, heat or electromagnetic action. The box as a whole and its content should be stored away from the moisture.

Product Delivery Set

RIB2 delivery set includes the following components:

- RIB2 printed circuit card;
- Low frequency signals converter;
- High frequency signals converter;
- **RADAR INTEGRATOR BOARD. INSTALLATION MANUAL** brochure;
- **RADAR INTEGRATOR BOARD. USER MANUAL** brochure.

1.6.3 RPB-3 Radar Processing Module

The RPB-3 module is the principal hardware component of ORS-3 radar processor. The RPB-3 module consists of a printed card and can be supplemented with ORS3 Interface Unit interface module as required. The Radar Integrator is fully manufactured by TRANSAS.

Delivery Requirements

Labelling and Packing

The RPB-3 module is delivered in a standard TRANSAS software packing box made of foam plastic. The box is placed in a multi-coloured cardboard cover. Located within, in a special wrapping is the printed card.

Transportation and Storage

Neither the whole box with the RPB-3 module, nor the printed circuit card separately, should be exposed to the strong mechanical, heat or electromagnetic action. The box as a whole and its content should be stored away from the moisture.

Product Delivery Set

The RPB-3 module delivery set includes the following components:

- The RPB-3 printed circuit card;
- ORS3 Interface Unit
- 1.8 m DB25M-DB25F cable for connecting RPB3 with ORS3 Interface Unit;

- **ORS3 INTERFACE UNIT. INSTALLATION MANUAL** brochure.

1.6.4 BM-E Radar Control Unit (BMECU)

BMECU device is intended for the control of BridgeMasterE (BM-E) radar, as well as for the conversion of BM-E radar signals for the connection to ORS2 and ORS3. The BMECU is fully manufactured by TRANSAS MARINE.

Delivery Requirements

Labelling and Packing

The BMECU is delivered in a standard company packing box used for all the products by TRANSAS MARINE.

Transportation and Storage

The box with BMECU should be exposed to the strong mechanical, heat or electromagnetic action. The box is not moisture proof.

Product Delivery Set

BMECU delivery set includes:

- BMECU device;
- 1.8 m DB25M-DB25F cable for connecting the BMECU with RPB3;
- **BMECU. INSTALLATION MANUAL** brochure.

1.7 COMPONENTS FROM OTHER MANUFACTURERES

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems may include hardware and software components from the OEM manufacturers, such as:

- computers, operating systems;
- networks and data exchange equipment;
- radars;
- direction finders;
- transponders;
- radio stations;
- various additional equipment;
- service software.

Any components from OEM manufacturers should, when delivered, necessarily have associated manufacturer documentation. LABELLING AND PACKING, TRANSPORTATION AND STORAGE of the components from the OEM manufacturers should be in a strict compliance with the requirements specified in the documentation for the appropriate components. DELIVERY SETS of the OEM products should also be in accordance with the documentation fore these products.

REGISTRATION AND WARRANTY SERVICING of the OEM products should also be in accordance with rules specified in the documentation for these products.

CHAPTER 2

Operator Display Unit

This chapter describes the Navi-Harbour software installation on ODU computers and ODU program settings. It describes a procedure for making the system backup copy and re-installing ODU. It proposes an approach for ensuring synchronising of the VTS system computers.

Copyright Transas Marine Ltd., 2003

2.1 INSTALLATION PLAN

This paragraph contains a plan of actions for the successful installation of software on ODU computers and ensuring of the system operation. The paragraph is provided with references to the sections of the manual with more detailed information.

To install Navi-Harbour software on ODU computers, use the following procedure:

1. Prepare ODU computers meeting requirements set forth in paragraph 2.2.1 (the number of computers is determined by the system configuration).
2. Check integrity of Navi-Harbour license disk (paragraph 2.5.2).

Perform the following operations for each ODU computer:

1. Check that the operating system has been installed on each computer, and the required settings have been made (paragraph 2.4). Make checks as described in paragraphs 2.4.2 and 2.4.3.
3. Install the dongle and Navi-Harbour software (follow the directions in paragraphs 2.5.1 and 2.5.3-2.5.4).
   – for ODU N (where N is not equal to 0) perform additional operations listed in paragraph 2.5.5.
4. Install electronic charts (see sec.2.5.6).
5. If the license permits the data registration, install the Record Server program (see sec.2.6).
6. Make the general system settings on ODU 0 as described in paragraph 2.8.
7. Make individual settings on each ODU as described in paragraph 2.9
8. Adjust Playback ODU as described in paragraph 2.10.

2.2 GENERAL REQUIREMENTS

2.2.1 ODU Computer Requirements

For the Operator Display Unit software to be installed and normally operate, the ODU computer has to meet the requirements specified in the table below:

Characteristic	Minimum requirement	Recommended
Processor	PIII/600 MHz	2x PIII/800 MHz
RAM	128Mb	256Mb
Video adaptor	4Mb AGP or PCI, 1600 x 1200	8Mb AGP or PCI 1600 x 1200
Hard disk	6Gb	10Gb
CD-ROM drive	Required	
Sound adaptor and acoustic system	Not required	Required
Network adaptor	Ethernet/Fast Ethernet	
Serial interface type	Determined by the interface type of sensors to be connected to the specific ODU	
Number of serial interface ports	Determined by the interface type of sensors to be connected to the specific ODU	
Telephone line modem	Required if a remote site is scheduled to be connected to the VTS system via a telephone line	
Operating system	Windows 2000 SP2, English/US version	
Database server software	MS SQL Server 7.0 Desktop or MSDE (Microsoft Database Engine from MS Office 2000) if a LIGHT configuration of the VTS information system is installed	
Monitor	17'', 1280x1024/75Hz	21'', 1600x1200/75Hz
Keyboard, mouse	Standard	
Colour palette	256 colours	

At the customer's option, other computer supporting Microsoft Windows 2000 can be used for the ODU. The use of computers with characteristics inferior to those specified in the Minimum Requirement column is ill advised.

2.2.2 Software Requirements

Operating System

All the components of Navi-Harbour 3.7 software package should run under the control of Microsoft Windows 2000 Operating System, English/US version, Service Pack 2.

Device Drivers

For each device used in the system (Video Adapter, Sound card, Network Adapter, printer) the corresponding device driver for the operation under the control of Microsoft Windows 2000 Operating System, English/US version, Service pack 2, providing necessary features, must be available.

With the use of Matrox-Millenium G450 DualHead video adapter driver, it is advisable to disable “Save/restore window position when programs are opened/closed” option: click the right mouse button on Matrox Power Desk icon on the indication panel[2] and select MULTI-DISPLAY CONTROLS... item; uncheck “Save/restore window position when programs are opened/closed” checkbox.

SQL Server

If the Navi-Harbour configuration includes a database, it is necessary to have the software listed in **VTS INFORMATION SYSTEM INSTALLATION AND SETUP MANUAL**.

2.3 REQUISITE CONDITIONS

For the installation of Navi-Harbour ODU software the following components should be available:

- ODU computer, meeting the requirements of sec. 2.2.1;
- a license CD with MS Windows 2000 SP2;
- a CD with Navi-Harbour software distribution set;
- a set of electronic charts;
- license files;
- a dongle complying with the license.

The set of electronic charts may be delivered on separate CD, on CD with Navi-Harbour software distribution set, or on a diskette.

The allowed features of Navi-Harbour software are determined by the license, which is a disk with the following files: `license.dat; items.dat; items.lst; setup.id;`

License files may be delivered both on a separate diskette and on the Navi-Harbour distribution CD.

[2] – indication panel (Tray) is an area in the right hand part of the Task bar, which shows system time, etc.

2.4 PREPARATORY OPERATIONS

2.4.1 Operating System Installation

Installation of the operating system in the ODU computer should be made by a qualified specialist holding an appropriate Microsoft certificate. Follow an appropriate installation instruction provided by Microsoft Corporation. The following features should be installed:

- Network Adapter(s) if the computer has this/these adapter(s);
- Remote Access network service if modem will be used;
- MS Loopback Adapter if none of the above is installed:
  - when installing network adapter switch “No, I want to select the hardware from a list…” radio button;
  - for the Hardware type select “Network adapters”;
  - select “Microsoft” from the list of Manufactures;
  - select MS Loopback Adapter in the list of Network adapters;
- TCP/IP network protocol;

  For TCP/IP and “Workgroup”/”Domain” settings consult your network administrator.
- in “Display Properties” dialogue box set the required parameters for “Colors” and “Screen area” sections in accordance with sec. 2.2.1 of this manual;

Note: Upgrade the operating system with Service Pack 2 if an earlier edition of Service Pack is installed or is not installed at all.

Special Case of Two Computers

If only two computers are connected to your network (ODU and ORS), a simplified procedure for setting IP addresses can be used, specifically:

1. On the Control Panel of ODU computer open “Network and Dial-up Connections” folder.
2. Click the right mouse button on “Local Area Connection” icon and select PROPERTIES menu item.
3. Select “Internet Protocol (TCP/IP)” and press the “Properties” button.
4. Switch the “Use the following IP Address” radio button:
   - in “IP address” enter a four-digit value, e.g. 192.168.0.1;
   - by all means enter 255.255.255.0 values in “Subnet Mask”;
   - “Default Gateway” field may be left unfilled;
   - press “OK” button.
5. On the Control Panel of ORS computer perform the operations described above in items 1-3.

6. Switch the “Use the following IP Address” radio button:
   – select “Specify an IP address” option;
   – in “IP address” enter a four-digit value, e.g. 192.168.0.2;
   – by all means enter 255.255.255.0 values in “Subnet Mask”;
   – “Default Gateway” field may be left unfilled;
   – press “OK” button.

2.4.2 Check of Network Software Adjustment

To check the correctness of IP address setting and to find out the IP address when it is received from the DHCP server, use the following procedure:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ipconfig” and press <Enter>.
3. List of IP addresses for every network adapter will be shown.

2.4.3 Check of TCP/IP Connection

To check TCP/IP connection between two computers use the following procedure for the both computers:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ping IP_ADDRESS” where IP_ADDRESS is the IP address of another computer, and press <Enter>.
3. Check that other computer responds to the requests. In this case the screen should display “Reply from IP_ADDRESS:” messages.

ATTENTION!

If some operations connected with the change of network configuration and/or TCP/IP protocol features are performed on the computer with installed Navi-Harbour software, it is necessary to re-install Navi-Harbour software.

2.5 ODU INSTALLATION

2.5.1 Dongle Installation

The process of hardware installation consists in connecting the dongle to the ODU computer. To connect the dongle use the following procedure:

- turn the computer off;
- connect the dongle to the parallel computer port;
- turn the computer on.

Note: The dongle is “transparent” for the printer, i.e. printing is possible regardless the dongle.

2.5.2 Check of License Disk Integrity

Before starting ODU software installation, it is recommended to check the integrity of the license CD:

- insert the license CD in the CD-ROM drive and run `tmsums.exe` program from the root folder. Getting the message “No errors were detected” means the installation disk is not damaged and it is ready for use;
- make copies of both the license CD and the license diskette;
- check the integrity of the back-up copy using the procedure described above.

2.5.3 Running Setup Program

Insert the Navi-Harbour installation CD into the CD-ROM drive; open the folder *Nh_ENG\disk01* and run `Setup.exe` program: the screen will display “Welcome” dialogue box.

2.5.4 Working with Setup Program

Target Directory Selection

The folder for the installation of Navi-Harbour software can be selected in “Select Target Directory” dialogue box. Confirm the suggested path (in this case the program will be installed into *C:\NH37* folder) or enter different path.

Program Manager Group Selection

When prompted to Select Program Manager Group confirm the suggested name or enter the name of your own.

License Installation

When prompted insert the license diskette into the FDD or specify the path for the copy of license diskette and press “OK” command button: the screen will display “License Information” dialogue box, which contains license information:

- make sure the Registration number (number of the license) is correct;
- make sure the Dongle number match the number of the supplied dongle.

Note: “Expiry date” field is not filled in for commercially delivered products. For demo versions this field contains some date.

Computer Restart

After the successful installation re-start the computer.

2.5.5 Completing Installation on ODU N

Use the following procedure to complete the installation for ODU N (where N is not equal to 0):

1. Rename the shortcut ODU 0 to ODU N.
2. Edit command string as further described:
   – make a right mouse click on ODU N shortcut and select PROPERTIES: “ODU N Properties” dialogue box will appear on the screen;
   – edit the string in the “Target” text box by adding ”/cN” so that for ODU 1 “Target” text box should contain the string “*C:\NH37\NaviHarb.exe/c1*”.
3. Open the folder where Navi-Harbour was installed and perform the following actions:
   – rename the file `Nharb0.ini` to `NharbN.ini`;
   – open the file `routing.ini`; delete the comment sign (“;”) and replace address 127.0.0.1 with the IP address of the computer where ODU 0 is installed.

2.5.6 Adding ODU Program to the Startup Menu

To provide automatic run of the ODU program at each system’s login, it is worthwhile to add this program to the Startup menu:

- click with the right mouse button on the “Start” button and select “Open All Users” in the context menu: “Startup Menu” dialogue box will appear;
- open “Programs” folder;
- open “Startup” folder;
- copy the program icon from the desktop to “Startup” folder.

2.5.7 Installation of Electronic Charts

The set of electronic charts, included in the delivery, may be stored on “Electronic Chart System & World Chart Folio” CD or on the Navi-Harbour software distributive CD:

- insert the CD with charts into CD-ROM drive;
- if the CD-ROM option for the automatic disk recognition is turned on, the electronic chart installation program will be run automatically, otherwise run `Setup.exe` program from the root folder of “… World Chart Folio” CD, or from *\Chart.inst* folder of the Navi-Harbour distributive CD: “Transas CD Setup” dialogue box will appear on the screen;
- select INSTALL LICENSED CHARTS menu item;
- when prompted to Select Target Directory check if “Location” of Navi-Harbour software is correct otherwise edit it as required;

- when “Set Transas Marine Electronic Chart Installation” dialogue box appears press “Start” command button.

ATTENTION!

If a warning on insufficient disk space for the chart installation appears press “Continue” command button to ignore this message.

- after the successful installation press “OK” command button of “Transas CD Setup” dialogue box.

Note: If a license for the given delivery includes a capability to use S57 format charts, it is necessary to install charts in this format and then load them for display in the ODU Chart Window and use for work.

2.5.8 Checking Installation Results

An indication of a successful installation is the display of “Installation completed successfully” message.

The “Navi-Harbour 3.7” window created during installation contains ODU N, Playback ODU and Save & Restore configuration shortcuts. One can copy these shortcuts on the desktop of the computer.

ATTENTION!

If the particular delivery license includes the use of the database, it is necessary to install the database in accordance with the directions specified in **VTS INFORMATION SYSTEM INSTALLATION AND SETUP MANUAL**.

2.6 RECORD SERVER

2.6.1 Record Server Program Installation

To install the Record Server program, insert licensed Navi-Harbour installation disk in the CD-ROM drive; open *RECSERV_ENG\disk01* folder and run `Setup.exe` program.

In “Select Target Directory” dialogue box, select a folder for the program installation: by default, the program is installed in *C:\Record Server 3.7* folder.

In “Select Program Folder” dialogue box, select the program group name: confirm the proposed “Record Server 3.70” name or enter another one.

2.6.2 Record Server Program Running Options

The Record Server can be run within ODU 0 (Remote Terminal) program or as a separate program. This capability is controlled by InternalLogging variable from [Config] section of `Nharb0.ini` (`NHRemtrm0.ini`) file:

- InternalLogging=0 – Record Server is run as a separate program;
- InternalLogging=1 (default) – Record Server is run within ODU 0 (Remote Terminal).

2.6.3 Editing NHRecServ.ini Configuration File

If the Record Server is run as a separate program (on the same computer with ODU 0 or on a separate computer), edit `NHRecServ.ini` file by using information provided in the table:

Variable	Section	Description
RecStatusUpdate	[Config]	Time period (in seconds) which sets frequency with which the server distributes diagnostic data records (e.g, current track size, file names, etc), the default value is 10 seconds
NHRecServ	[Gateway]	Number of the port for the communication with VTS server (same as that set in “Record Server” dialogue box of ODU 0 program)
File Server	[Remote]	Address of VTS IP server (ODU 0 computer)
StartInTray	[Mode]	Adjustment of automatic program window minimising at the start: 1 – at the start the program is immediately minimised to a mark in the system area (Tray); 0 (default value) – at the start. the program window is displayed

If the Record Server is run within ODU 0, to change the diagnostic message distribution frequency, use RecStatusUpdate variable from [Config] section of `Nharb0.ini` file.

2.7 RUNNING ODU

To run Navi-Harbour program for ODU use either of the following procedures:

- make a double click on ODU N icon or

- select START\PROGRAMS\NAVI-HARBOUR 3.7\ODU N menu item.

2.8 GENERAL SYSTEM SETTINGS

After the installation of Navi-Harbour software and electronic charts, it is advisable to make general system settings.

Check if the dongle is connected to the parallel ODU 0 computer port (LPT).

Run Navi-Harbour program for ODU0 as described in the paragraph 2.7.

Note: If the license for this delivery includes a Radar Processor option the program starts working in Demo mode.

The general system settings include VTS Configuration, ODU/OS Configuration, operator list, security system and default alarms:

1. Create VTS Configuration corresponding to the current area as described in sec. 2.8.1 of this manual.

Note: Name of the port can be used as the VTS Configuration name.

2. Edit ODU/OS Configuration if the system is multi-console: add each ODU different from ODU 0 (see sec. 2.8.2 of this manual).
3. Set the list of operators who can work at the system's Operator Stations (see sec. 2.8.3).
4. Set the Alarms by Default (see sec.2.8.4 of this manual).
5. Set the access rights (see sec.2.8.5 of this manual).
6. Create VTS chart objects (see sec.2.8.6).
7. Edit Sensor configuration (see sec.2.8.7).
8. Set the Record Server configuration (see sec.2.8.8)
9. Set the network configuration (see sec.2.8.9).

2.8.1 Creating a VTS Configuration

VTS configuration contains the following data:

- Set and configuration of sensors;
- Set of loaded navigational charts for the given area;
- VTS chart;
- Configuration of ODU, Desktop and Chart Windows;
- Default alarm settings;
- Tracking options.

To create a new VTS configuration use the following procedure:

- select SUPERVISOR\OPERATION MODE... menu item: the screen will display "VTS Operation Mode" dialogue box;
- switch the system to Standby Operating mode;
- press command button of "VTS configuration" section: the screen will display "Select VTS Configuration" dialogue box;

- enter the name for new VTS configuration in the text box and press “OK” command button of “Select VTS Configuration” dialogue box;
- press “OK” command button of “VTS Operation Mode” dialogue box.

Note: After a new VTS configuration is created, a new VTS chart connected with this configuration and containing no objects is created on the disk.

2.8.2 Setting of ODU/OS Configuration

To set the configuration of ODU/OSs’ included in the system use the following procedure:

- select SUPERVISOR\ODU/OS CONFIGURATION... menu item: the screen will display “ODU-OS Configuration” dialogue box;
- alter ODU/OS configuration using the procedures described below;
- press “OK” command button.

To Add ODU/OS

To add ODU/OS use the following procedure:

- press “Add ODU…” or “Add OS…” command button of “ODU-OS Configuration” dialogue box respectively: “ODU(OS) Properties” dialogue box will be displayed;
- enter the ODU’s (OS’s) ID number in “ODU(OS) Id” text box;
  - when adding OS select backup OS. To do this select OS from “Available OS” list and press “>>“ command button.

Note: Should all the ODU’s of the OS responsible for a certain zone fail, the responsibility is passed to the backup OS.

  - if necessary, delete a backup OS. To do this select a backup OS from “Backup OS” list and press button “<<“ command button;
  - if necessary, re-order the sequence of backup OS using “Up” and “Down” command buttons;
- confirm that the entered data is correct and press “OK” button.

To Delete ODU/OS

To delete ODU/OS use the following procedure:

- select the ODU/OS to be deleted from “Units” list of “ODU-OS Configuration” dialogue box;
- press “Remove” command button.

To View and Edit ODU/OS Features

To view and edit ODU/OS features use the following procedure:

- select an ODU/OS from “Units” list of “ODU-OS Configuration” dialogue box;
- press “Properties” command button: the screen will display “ODU(OS) Properties” dialogue box;
- alter ODU/OS properties and press “OK” command button of “ODU(OS) Properties” dialogue box.

2.8.3 Operator List

One of the Navi-Harbour system's features is a list of operators who can work at the system's Operator Stations (OS). Operator Station is a working place of one operator and can include several ODUs. For each operator, the list stores his/her name and a password.

Editing of Operator List

Editing of the operator list is one of privileged operations, to perform it would require "Operator list" privilege. The following operations are accessible for any user with an access level permitting the editing of the operator list:

- adding new operators;
- deleting operators;
- changing the listed operators' passwords.
- select SUPERVISOR\OPERATORS... menu item: the screen will display "VTS Operator List" dialogue box;
- to add a new operator, press "Add" button: the screen will display "Operator's Properties" dialogue box, which can be filled out in two ways:
  - if the system configuration includes a database (DB), the new operator can be linked with the Database Operator Reference Book:

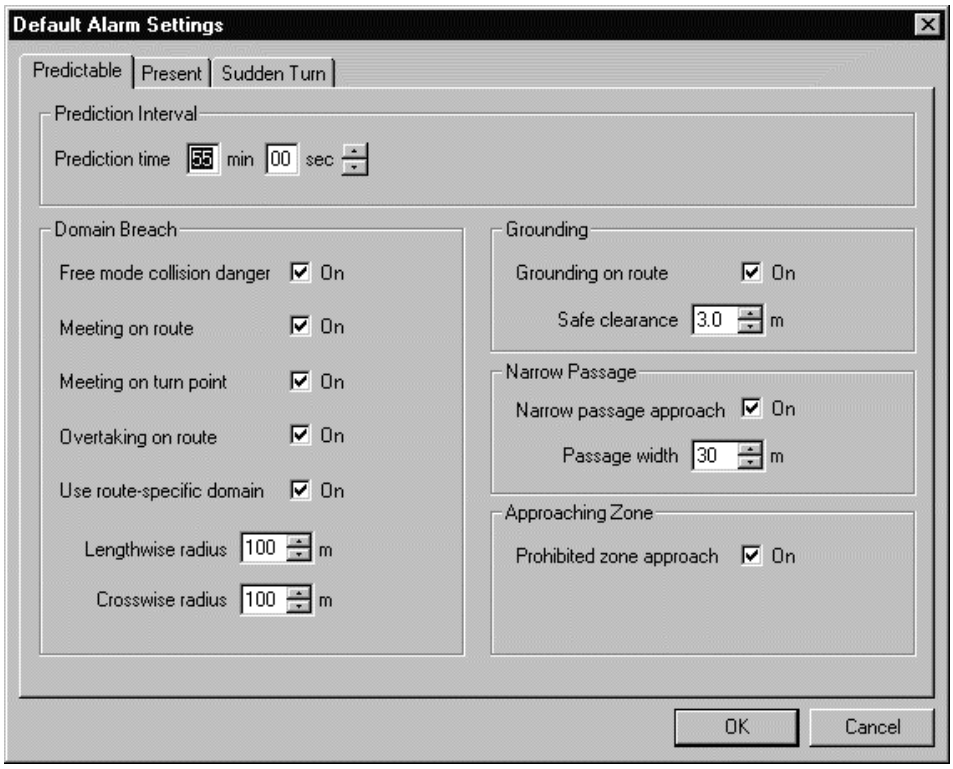
    press "Attach" button of "Database" section;
    if there is no required operator in the database, first add him/her (press <Ctrl>+<N>, fill out the reference book entry fields, save in the DB);
    select the operator by double clicking the mouse;
    "Name" field will be filled out automatically with the name selected from the reference book, then enter the VTS operator's password in "Password" field and press "OK".
  - enter the name and password in the respective fields and press "OK" button.
- to delete an operator, select this operator from the list and press "Delete" button;
- to change a password of a certain operator, select this operator from the list and press "Change Password…" button: the screen will display "Operator's Properties" dialogue box where a new password should be entered.

2.8.4 Setting the Alarms by Default

The concept of alarm setting includes the selection of the enabled/disabled status of the given alarm and the selection of a digital value for the alarm trigger-off threshold. All the types of alarms can be set individually for each target, a group of targets and by default. If no specific alarm parameters are set for a particular target, alarms for this target will be generated by default.

To set the alarms by default use the following procedure:

- select SUPERVISOR\DEFAULT ALARM SETTINGS… menu item. After the authorisation check "Default Alarm Settings" dialogue box will appear on the screen:



- select each of the tabs by turn ("Predictable", "Present" and "Sudden Turn") and make the alarm settings:
  - set in the ON position check boxes of all the alarms which must be generated by default;
  - set in the OFF position check boxes of all the alarms which must not be generated by default;
  - use the appropriate spin boxes to set the desired thresholds of alarms generation, if any.
- make sure the settings are correct and press "OK" button.

To change alarm settings for some target or group of targets see the paragraph **Setting the Alarms** in **ODU USER MANUAL**, where these procedures are detailed.

2.8.5 System Security

The Navi-Harbour system security mechanism is based on the use of different access levels. Corresponding to each level is its own password and a set of permitted operations (privileges).

System characteristics control operations are referred to as privileged operations, e.g, editing of sensor configuration. The performance of such operations is not always permitted, and only at an appropriate access level.

The system has three built in access levels: Administrator, System Engineer and Operator. These cannot be deleted, or their set of privileges changed. Besides, you can add an arbitrary number of new access levels, and assign an own set of permitted operations for each.

The table below contains a full set of privilege operations specifying the built in access levels which they are permitted for:

Privilege operation	Administrator	System Engineer	Operator
VTS chart editing	Yes	Yes	–
Sensor chart editing	Yes	Yes	–
Navigational chart editing	Yes	Yes	–
Own chart editing	Yes	Yes	–
ODU configuration	Yes	Yes	–
Sensor configuration	Yes	Yes	–
Network configuration	Yes	Yes	–
Default alarm settings	Yes	Yes	–
List of operators	Yes	Yes	–
VTS Operation modes	Yes	Yes	–
System security parameters	Yes	–	–
Logging control	Yes	–	–
Closing of VTS Server program	Yes	Yes	–
Sensor control – general[3]	Yes	Yes	Yes
Sensor control – advanced[3]	Yes	Yes	–
Sensor control – configuration[3]	Yes	Yes	–
Window configuration	Yes	Yes	–
Changing of target options	Yes	Yes	–
Changing of chart settings	Yes	Yes	–
Changing of message options	Yes	Yes	–
Defining desktop/ODU configurations	Yes	Yes	–

[3] – the sensor control commands.

The sensor control commands are distributed among the access levels as follows:

Sensor	General	Advanced	Configuration
AIS Transponder	Control of power supply; Selection of an active transponder is case of full redundancy	Restart	Control of the radio channel parameters and special transponder zones
ORS-2, ORS-3	Change of signal processing parameters (Rain, Sea, Gain, Auto Gain), Masking, Correlation, Highlight persistent targets, Local gain	Soft and Hard Reset; Switching over to the backup ORS; Selection of the ORS operation mode and selection of a set of parameters (Control Set)	
Radars (except for RYAD radar)	Parameters in “Radar” tab of “Radar <name> Control” dialogue box		“Advanced” control panel
RYAD radar	Parameters in “Radar” tab of “Radar <name> Control” dialogue box	Change in the radar receiver adjustment and turning on of the automatic frequency control (AFC)	Adjustment of Sensitivity and Sea parameters
CCTV camera	Parameters in “Control” tab of “CCTV <name> Control” dialogue box		

As long as the Administrator password is not set, the system is not protected: all the privilege operations are permitted and their corresponding menu items are active. As soon as the Administrator password is set, the privilege operation menu items are prohibited. As a certain access level is selected, menu items permitted at this level are enabled.

There is a special mode referred to as Privilege Request mode in which, regardless of the current access level, all the menu items are active (the mode activation procedure is detailed in sec. **Turning on/off of the Privilege Request Mode** of this Manual). If an operation is selected in this mode, which is not permitted at the current level, the system requests for the access level permitting the performance of such operation, and an appropriate password.

Note: Selection of a new level in a situation like this, only means the obtaining of access for the performance of the requested operation, the current access level remaining unchanged.

For the closing of ODU 0 program, the system always requests for the appropriate access level, even if the current level allows this operation to be performed.

As the ODU program is exited from, the set of privileges is retained and is restored when the program is run the next time.

Access Level Adjustment

The adjustment of access levels is performed from any of the system ODU’s. For the adjustment, use the following procedure:

- add the required number of new access levels and define their properties (see sec. **Adding of a New Access Level**);
- set passwords for the built in access levels (see sec. **Changing of the Access Level Properties**).

Editing of the Access Level System

To add new access levels, delete the existing ones (except built-in levels), and to alter properties of the available access levels, use “System security” dialogue window:

- select SUPERVISOR\SECURITY… menu item: the screen displays “System security” dialogue window;
- make the necessary changes using the procedures described below;
- press “OK” button to save the changes you have made; or
- press “Cancel” button to close “System security” dialogue window without saving changes.

Adding of a New Access Level

To a new access level, perform the following procedure:

- press “Add Level…” button: “General” dialogue window is displayed;
- use “Display name” text box to enter the name of the new access level;
- in “Enabled operations” section, select operation permitted at this access level by checking the necessary checkboxes, and press “Next” button.

Note: For a simultaneous selection of several operations listed one after another, select the first operation from the group with the cursor, then keeping <Shift> key depressed, select the last operation, whereupon you should release <Shift> key and check a checkbox of any of the selected operations: all the operations of the group will be checked.

For a simultaneous selection of all the operations, select the first of them with the cursor and then press <End> key keeping <Shift> key depressed.

- use “Password” dialogue window to enter the new level password and press “Finish” button.

Deleting of an Access Level

Any access level except built-in level can be deleted by using the following procedure:

- from the window with “Access levels” list, select the name of the level which is required to be deleted;
- press “Delete Level” button: the screen will display a request to confirm the deleting operation:
  - press “Yes” button to delete the selected level; or
  - press “No” button to cancel the deleting operation.

Changing of the Access Level Properties

The set of permitted operations can be changed for any access level except built-in level. For the built-in access levels, passwords can be changed. To alter the level properties, use the following procedure:

- from the window with “Access levels” list, select the name of the level whose properties are required to be altered;
- press “Level Properties…” button: “Access Level Properties” dialogue window will be displayed:
  - if it is necessary to change the level name, use “Level name” section;
  - in “Enabled operations” section, check/uncheck names of operations whose performance should be permitted/prohibited at the given access level.

Note: For a simultaneous change of status of several checkboxes (checking/unchecking), select the required operations with the cursor, then check or uncheck a checkbox for one of the selected operations. Like always, in order to select a group of successively listed operations, select the first of them with the cursor, and then the last operation of the group, keeping <Shift> key depressed; to select isolated operations, keep <Ctrl> key depressed.

  - if the level password is required to be changed, switch to “Password” tab and set a new password.

Note: The level access password is stored in the encoded form. In the access level properties the password is shown as six asterisks, and if the password is not set, in the form of an empty line.

  - press “OK” button.

Turning on/off of the Privilege Request Mode

To turn on the Privilege Request mode, select ODU\INSTANT ACCESS LEVEL CHANGE menu item: the item will be highlighted with a marker.

To turn this mode off, remove the marker from the aforementioned menu item by selecting ODU\INSTANT ACCESS LEVEL CHANGE menu item again.

Selection of the Access Level

The current access level is selected in “Access Level” dialogue window on each ODU of the system. Use the following procedure:

- select ODU/ACCESS LEVEL... menu item: the screen will display “Access Level” dialogue window;
- from the drop down list select the access level and enter the password corresponding to this level in “Password” text box;
- press “OK” button.

Note: The current access level can be changed without password input if the set of permitted operations (privileges) of the new level is also permitted for the current level.

If the Privilege Request mode is not turned on, only the operations permitted at this level become available after the selection of the access level.

2.8.6 Creating VTS Chart Objects

After a new VTS configuration is created, a new VTS chart connected with this configuration and containing no objects is created on the disk.

ATTENTION!

If the system includes “Radar” and/or “Direction Finder” type sensors, add to the VTS chart “Radar” and/or “Direction finder antennae” type objects corresponding to them.

To create a new VTS object, use the following procedure:

- select SUPERVISOR\ENABLE VTS CHART EDITING menu item;
- select EDIT\NEW OBJECT: “New object’s chart & Class” dialogue box will appear on the screen;
- make a double click on VTS (VTS chart) line to open the list of VTS chart objects;
- select the required object in the list and press “Next” or “Finish” button (depending on the object type the dialogue box contains one of these buttons).

Creating “Radar” Object

To create “Radar” select “Radars” from the list of objects and press “Next>“ command button: “New object’s General Properties” dialogue box will appear:

- in the text field “Name” enter the name, in “ID number” spin box – ID number of the used radar, in “Elevation” spin box – radar height above sea level;
- use “RP ID number” spin box to enter the ID number of this object as possible Reference point (admissible range is 1,…99):
  - “RP ID number” is used for the quick setting of the Reference point into this object.
- in “Coordinates setup” dialogue window switch ”Manual” radio button and press “Finish” button: the cursor becomes arrow-shaped with small orange square ahead of it;
- click the mouse to set the object on its place on the chart.

Creating “Direction Finder Antennae” Object

To create “Direction finder antennae” object, select it from the list of objects and press “Next>“ button: the screen will display “New object’s General Properties” dialogue box:

- in the text field “Name” enter the direction finder’s name, in “ID number” spin box – its ID number.

Note: Each object of “Direction Finder Antennae” class should have a non-empty name which does no coincide with names of other objects in this class.

- in the spin box “RP ID number” enter the ID number of this object as possible Reference point (admissible range is 1,…99):
  - “RP ID number” is used for the quick setting of the Reference point into this object.
- in “Coordinates setup” dialogue window switch ”Manual” radio button and press “Finish” button: the cursor becomes arrow-shaped with small orange square ahead of it;
- click the mouse to set the object on its place on the chart.

Creating Measurement Centres

Measurement centres are special chart objects where a Reference Point can be positioned. The ODU Reference point is used for:

- measuring the range and bearing of the current cursor position, obtained values displayed on the Cursor Data Panel;
- measuring the range and bearing of a target from the measurement centre, obtained values displayed on the Target table for all the types of targets;
- displaying the range rings.

Any geographic point can be selected for the ODU Reference point. If there are several points, which the measurements are most frequently required to be made from, plot “Centres of measurement” VTS objects in these points on the chart:

- select “Centres of measurement” from the list of objects and press the “Next>“ button: the screen will display “New object’s General Properties” dialogue box;
- in text field “Name” enter the name of the given measurement centre;
- in spin box “RP ID number” enter the ID number of this object as possible Reference point:
  - “RP ID number” is used for the quick setting of the Reference point into this object (admissible range is 1,…99).
- in “Coordinates setup” dialogue window switch ”Manual” radio button and press “Finish” button: the cursor becomes arrow-shaped with small orange square ahead of it;
- click the mouse to set the object on its place on the chart.

Creating Routes

All the routes existing in the serviced area should necessarily be added to the VTS chart. See the paragraph “Procedures for creating and editing routes” of ODU User manual, which contains necessary information.

Creating Piers

In the pier location places, plot piers on the VTS chart:

- select “Piers” from the list of objects and press “Next>“ button: the screen will display “New object’s General Properties” dialogue box;
- in text field “Name” enter the name of the given pier;
- enter the required value in “Maximal range for moored target” spin box;
- choose the required radio button in “Allowed mooring side” unit;
- to identify this pier with some item of “Pier” type in “Positions” reference book of Information system press “Attach” button, select the item in the reference book (add a new item when no proper item available and select it);
- in “Coordinates setup” dialogue box, select ”Manual” radio button and press “Finish” button: the cursor becomes arrow-shaped with small orange square ahead of it;
- click the mouse to set the object on its place on the chart.

Note: Identified “Pier” type objects can be used in automatic filling the database.

Creating “Buoy Guarding Marks” Objects

For all the buoys required to be monitored, create “Buoy guarding marks” objects and plot them on the chart in accordance with the position of these buoys in the monitored area. If the tracking system does not detect a buoy within the set radius from the specified place, an appropriate message is generated:

- select “Buoy guarding marks” from the list of objects and press “Next>“ button: the screen will display “New object’s General Properties” dialogue box;
- in text field “Name” enter the name of the given buoy, in “ID number” spin box – its ID number;
- use the “Acquisition radius” spin box to enter the admissible buoys shift value which, if exceeded, generates an appropriate warning;
- check “Generate alarm when lost” checkbox to generate an alarm in case of a loss of the buoy.

Note: It is advisable to disable the generation of a loss alarm for the buoys in the places of the unstable radar signal.

ATTENTION!

By all means create “Buoy Guarding Marks” objects in the places where ships pass close to the buoys.

Creating “CCTV Cameras” Objects

- Select “CCTV cameras” from the list of objects and press “Next>” button: the screen will display “New object’s General Properties” dialogue box;
- In text field “Name” enter the name of the camera;
- In “ID number” spin box enter its ID number;
- In “Camera altitude” spin box enter the camera installation height value.

2.8.7 Setting of Sensor Configuration

To set the configuration of sensors included in the system perform the following procedure:

- select SUPERVISOR\SENSOR CONFIGURATION... menu item: “Sensor Configuration” dialogue box will appear on the screen;
- change the sensor configuration using the procedures described below;
- press “OK” command button.

Note: The item Sensor on the Main menu is missing until at least one sensor is added to the Sensor Configuration.

It is impossible to change the Sensor Configuration when sensor chart editing is enabled. To edit the Sensor Configuration first disable sensor chart editing.

To Add a New Sensor

- Select the class of the sensor to be added with the cursor;
- Press “Add…”command button.

Note: In the list sensor classes are marked with a blue square ■.

- Enter the required sensor parameters. The parameters of various sensors which should be specified can be found in corresponding sections for each particular sensor;
- Press “OK” command button of “Sensor Configuration” dialogue box.

Note: When it is necessary to learn the computer IP address run a standard MS Windows `ipconfig.exe` program.

IP socket numbers specified during the sensor configuring should be unique for each sensor.

The use of 127.0.0.1 address as the IP address of the sensor is not possible unless the system is fully installed in a single computer.

To Delete a Sensor

To delete a sensor, use the following procedure:

- select the required sensor from “Sensors:” list of “Sensor Configuration” dialogue box.

Note: In the list sensors are marked with symbol.

- press “Remove” command button.

To View and Edit Sensor Properties

To view and edit the properties of a sensor use the following procedure:

- select a sensor from “Sensors:” list of “Sensor Configuration” dialogue box.

Note: In the list sensors are marked with symbol.

When deleting some sensor all the objects of this sensor individual chart will automatically be deleted.

- press “Properties” command button: the screen will display “Sensor Properties” dialogue box;
- make the necessary changes in the sensor parameters and press “OK” command button of “Sensor Properties” dialogue box.

2.8.8 Record Server Configuration

To Adjust Network Connection with Record Server

To specify the Record Server address, in ODU 0 program select SUPERVISOR\RECORD SERVER CONFIGURATION... menu item: “Record server” dialogue box is displayed:

- use “Record server address” text field to enter IP address of the computer where the Record Server is run.

ATTENTION!

The use of 127.0.0.1 address is not allowed unless the Record Server is run within ODU 0 and there are no other ODU’s in the system.

- use “Record server port” spin box to enter the number of the port used for connection with the Record Server:
  - use 2000 default value if the server is run within ODU 0;
  - change the port number is the Record Server is run as a separate program on the same computer with ODU 0. Specify this value in NHRecServ variable of [Gateway] section in `NHRecServ.ini` file:

NHRecServ=XXXX

2.8.9 Network Configuration

As a rule, in the simplest case Navi-Harbour system consists of several ODU computers and one radar processor computer (ORS). Data exchange between ORS computer and ODU computers is via low-bit-rate channels. If your system configuration matches the one described here, follow the recommendations provided in this paragraph.

For systems with more complex configuration, familiarise yourself with contents of chapter 12 and perform the procedures described there:

1. On ODU computer: assign IP addresses from 192.168.0.1 – 192.168.0.128 range.
2. On ORS computer: assign IP address from 192.168.0.129 – 192.168.0.255 range.
3. Create ODU subnet. To do this:
   - on ODU 0, select SUPERVISOR\NETWORK CONFIGURATION menu item;
   - press “Add Subnet” button;
   - enter the ODU subnet name in “Subnet name” field;
   - use “Subnet address” field to enter 192.168.0.0 string;
   - use “Subnet mask” field to enter 255.255.255.0 string;
   - check “Subnet has proxy” checkbox;
   - use “Proxy Address” field to enter IP address of ODU 0 computer.

4. Create ORS subnet. To do this:
   – on ODU 0, select SUPERVISOR\NETWORK CONFIGURATION menu item;
   – press “Add Subnet” button;
   – use “Subnet name” field to enter the ORS subnet name;
   – use “Subnet address” field to enter 192.168.0.0 address;
   – use “Subnet mask” field to enter 255.255.255.0 string.

Before starting the use of Navi-Harbour system, make a check of its functionality. This check procedure is described in sec. 2.9.13.

2.9 INDIVIDUAL ODU SETTINGS

Follow the recommendations of this paragraph to make individual settings for each ODU of the system.

ODU setup is performed after the installation of the Navi-Harbour system, electronic charts, and general system settings have been made (see sec.2.8).

Check if the dongle is connected to the parallel computer port (LPT).

ATTENTION!

ODU N should be run with ODU 0 operating.

Note: Since ODU N connects to ODU 0 check if there is network connection with ODU 0 computer. Please ascertain that ODU/OS Configuration contains ODU N (select on ODU 0 SUPERVISOR\ODU/OS CONFIGURATION…).

Run ODU (see sec. 2.7 of this manual):

1. Arrange the toolbars on the screen dragging them to their places.
2. Select WINDOW\TILE menu item to get the tiled arrangement of screen objects.
3. Select chart display options:
   – set the units of measurement (see sec. 2.9.1 of this manual);
   – set display precision and chart correction parameters (see sec. 2.9.1 of this manual);
   – correct display accuracy on the screen (see sec. 2.9.1 of this manual).
4. Set the format of date/time presentation (see sec.2.9.1).
5. Set an option for confirming the operation of closing a Chart Window (see sec.2.9.1).
6. Load the charts (see sec. 2.9.2 of this manual for the details).
7. Change the Reference point position (select CURSOR\REFERENCE POINT menu item and click the mouse to set the Reference point on its place on the chart).
8. Create modifiable charts if editing of nautical charts is required (see sec.2.9.3 of this manual).

9. Set the range of displayed chart information: switch off the display of unnecessary layers and object classes, switch on/off the display of chart borders, range rings and geographic grid (as described in sec.2.9.4); select the radar (radars) whose picture should be presented in the Chart Window (see **OPERATOR DISPLAY UNIT USER MANUAL** sec. 4.4.2 for the details).
10. Configure the desktop (see sec.2.9.5 of this manual).
11. Set the Message Acknowledgement and Indication Options (see sec.2.9.6).
12. Set the Parameters of Sound Warning (see sec.2.9.7).
13. Set the Information Panel Fonts (see sec.2.9.8).
14. Set Radar Image Colours (see sec.2.9.9).
15. Set the Printing Options (see sec.2.9.10).
16. If the mouse manipulator of ODU computer is equipped with the wheel, adjust the use of Intellimouse capabilities (see sec.2.9.11).
17. Select the geodetic datum in use (see sec.2.9.12).

2.9.1 Setting the Chart Display Options

Chart display options are adjusted in “Chart Settings” dialogue window. The change of chart display options is a privileged operation and requires “Changing of chart settings” privilege.

To open “Chart Settings” dialogue box, select CHART\SETTINGS menu item.

To Set the Units for Numeric Data Presentation

Select “Units” tab and make the following settings:

- use radio buttons of “Short distance” box to set the measurement units for the short distance presentation;
- use radio buttons of “Long distance” box to set the measurement units for the long distance presentation;
- use radio buttons of “Speed” box to set the measurement units for speed presentation;
- use check boxes of “Angle” box to set the measurement units for angle value presentation.

To Set the Coordinate Display Options

Select the “Coordinates” tab and make the following settings:

- use radio buttons of “Display precision” box to set the precision of the coordinate presentation;
- if required set the parameters of coordinate correction in “Correction” box.

To Correct a Display Accuracy on the Screen

To correct the accuracy of the way object sizes are presented on the screen, select the “Screen” tab and make the following actions:

- use a high precision measuring instrument to measure the width and height of the blue rectangle displayed on the screen;
- select the used measurement unit in the “Units” drop-down list box and enter the measured values in “Width” and “Height” spin boxes;
- press “OK” command button.

To Set the Format of Date/Time Presentation

Select “Time/Data” tab and make the following settings:

- use radio buttons of “Date” box to set the format of the date presentation;
- use radio buttons of “Time” box to set the format of time presentation.

To Set the Request Before Closing Chart Window

Select “Window” tab and make the following setting:

- check/uncheck “Prompt before closing Chart Window” check box to turn on/off an option for confirming the operation of closing a Chart Window.

2.9.2 Loading Electronic Charts

If electronic charts have not yet been installed, use the procedure detailed in sec.2.5.7.

To load electronic charts in the active Chart Window use the following procedure:

- select CHART\CHART LIST… menu item: the screen will display “Chart List” dialogue box;
- if “Available charts” list does not contain the charts one need to load press “Directories…” command button: the screen will display “Chart directories” dialogue box:
  - press “Add directory” command button: the screen will display “Chart directory properties” dialogue box;
  - enter “Chart” in the “Path” text box and press “OK” command button of “Chart directory properties”;
  - press “Close” command button of “Chart directories” dialogue box.
- select the chart to be loaded from the “Available charts” list and press “<<Add” command button: the selected chart will be loaded in the Chart Window;
- press “Focus” command button to focus on the loaded chart as required;
- press “Focus all” command button to focus on all the loaded charts as required;
- press “Close” command button of “Chart List” dialogue box.

For more details of work with the electronic charts see **ODU USER MANUAL**.

Note: It is recommended to load a chart with the least scale on the bottom of all others and a chart with the greatest scale on the top of other charts.

It is easy to re-arrange the chart order using “Up” and “Down” command buttons of “Chart list” dialogue box.

ATTENTION!

It is recommended to save the current view as initial so that each new chart window will be opened in this particular configuration. To do this, select CHART\WINDOW\SAVE AS INITIAL menu item.

2.9.3 Creating Modifiable Charts

The details of working with charts are described in ODU User Manual (Chapter 5). Recall here that reference charts delivered as a part of ODU software are not subject to editing. If editing of nautical charts is required, use the procedure of creating modifiable charts described below:

- select EDIT\MODIFIABLE CHARTS\CREATE MODIFIABLE CHART… menu item: the screen will display “Convert Reference Chart To Modifiable” dialogue box;
- select a chart from the list of reference charts and press “Convert” command button: the screen will display “Modifiable Chart's Path” dialogue box;
- enter the directory for storage of modifiable charts and the name of the modifiable chart that is being created in “Path” text box and press “OK” command button.

Note: By default the modifiable chart, which is being created, has the same name as the reference chart, which it is made from.

As a result of performing the procedures described above, the following events take place:

- a modifiable chart with a specified name is created on the disk in the folder for the storage of modifiable charts;
- a newly created modifiable chart is displayed in the active Chart Window replacing the reference chart and is allowed for editing.

2.9.4 Setting the Range of Displayed Chart Information

The display of some chart objects can be turned off. The range of displayed chart information is set in “Chart classes” dialogue box. To set the range of displayed objects of Transas Marine v6.0 navigational charts, use the following procedure:

- select CHART\OVERLAYS\TRANSAS MARINE V.6.0... menu item: “Chart Classes (Transas Marine v6.0)” dialogue box will appear on the screen;
- in the list box, select the classes to be displayed;
- deselect the classes whose display is not required;
- if required use “All” command button for selecting all the classes;
- if required use “None” command button for deselecting all the classes;
- press “OK” button.

Repeat the described above procedure to set the range of displayed information for the User chart and VTS chart (select CHART\OVERLAYS\USER CHART... and CHART\OVERLAYS\VTS CHART... respectively).

To adjust the set of S57 format chart data to be displayed, use “S57 v3” dialogue window:

- select CHART\OVERLAYS\S57 V3...menu item;
- on “Classes” tab, select classes of objects whose display should be turned on (by checking the appropriate checkboxes) and cancel the selection of the classes which are not required to be displayed;
- switch to “Display options” tab and select the necessary parameters:
  - set values in “Safety contour” and “Safety depth” spin boxes (in metres);
  - set the value in “Shallow contour” spin box (such areas are hatched if “Shallow pattern” checkbox is checked);
  - set the value in “Deep contour” spin box (such area are marked with the colour of filling if “Four shades” checkbox is checked);
  - check “Full light lines” checkbox to turn on the display of complete light sector limits whose length correspond to the light visibility range;
  - check “Plain areas” checkbox to disable the use of complex fillings and line styles;
  - check “Simplified points” checkbox to enable the use of “simplified” symbols differing considerably from those accepted on the paper charts;
  - check “Show inform” checkbox to mark off objects which have INFORM attribute with a special symbol.

Whenever a display category other than “Other display” is selected, the display of all the classes except “Ferry routes” class, is automatically turned off, and the other way round: with the turning on of the display of any class except “Ferry routes”, “Other display” category is automatically selected.

To Switch on/off the Display of Chart Borders

To switch on/off the option for the display of chart borders check/uncheck CHART\OVERLAYS\BORDERS menu item.

Note: After this option has been switched on the Chart Window will display the borders of those charts only which are stored in the defined chart directories.

To Switch on/off the Display of Geographic Grid

To turn on/off the display of the geographic grid CHECK/UNCHECK CHART\OVERLAYS\GRID menu item.

To Switch on/off the Display of Range Rings

To turn on/off the display of the range rings CHECK/UNCHECK CHART\OVERLAYS\RINGS menu item.

2.9.5 Configuring the Desktop

The concept of Desktop configuration includes all variable characteristics, which affect the features of Desktop. Such characteristics include:

- set, size, arrangement and names of the Chart Windows;
- loaded charts and their order for each Chart Window;
- scale and position of the centre of the displayed part of the area for each Chart Window;
- chart angle of turn around the Chart Window centre for each Chart Window;
- set of displayed overlays and Chart classes for each Chart Window;
- set and arrangement of displayed Information Panels;
- size of data fields and order of sorting list elements for each Information Panel;
- set, size and arrangement of toolbars;
- display status of the Status Bar.

To Save the Desktop Configuration

The desktop configuration can be saved as a current configuration or named configuration. The current configuration is loaded by default at the program start. To load a named configuration, perform the loading operation.

To save the desktop configuration as a current one select ODU\DESKTOP\SAVE menu item.

Note: For the automatic saving of desktop configuration as current when exiting from the program, check ODU\DESKTOP\AUTO save menu item.

To save the desktop configuration under a new or previously saved name use the following procedure:

- select ODU\DESKTOP\SAVE AS... menu item: “Save desktop” dialogue box will appear on the screen.

Note: This is a privileged operation. You will need “Defining desktop/ODU configurations” privilege to perform it.

- use the keyboard for the input of saved configuration name in the text box (when a new configuration is saved) or select the name from the list (when the existing configuration is being replaced);
- confirm that the entered name is correct and press “OK” button.

To Load the Desktop Configuration

To load a previously saved desktop configuration use the following procedure:

- select ODU\DESKTOP\LOAD... menu item: “Load desktop” dialogue box will appear on the screen;
- use the keyboard for the input of saved configuration name in the text box or select the name from the list;
- confirm that the entered name is correct and press “OK” button.

To Rename or Delete the Desktop Configuration File

To rename or delete the Desktop configuration file use the following procedure:

- select ODU\DESKTOP\ORGANIZE... menu item: “Organize desktop files” dialogue box will appear on the screen;
- select the name of the desktop configuration file which has to be renamed or deleted;
- press “Delete” command button to delete the selected desktop configuration file;
- press “Rename” command button to rename the selected desktop configuration file: “Rename file” dialogue box will appear on the screen;
- type the name of the new desktop configuration file and press “OK” command button in “Rename file” dialogue box;
- press “OK” command button of “Organize desktop files” dialogue box.

2.9.6 To Set the Message Acknowledgement and Indication Options

The alarm acknowledgement operation is aimed at the mandatory calling of the operator's attention to each alarm individually. The alarms are displayed on the message panel, which is divided into three zones:

- top part: acknowledged message zone;
- middle part: zone of the first unacknowledged alarm;
- bottom part: zone of unacknowledged alarms line.

A message is acknowledged by clicking the left mouse button on its line in the middle part, or automatically after a set time interval if an appropriate option is turned on as described below. After the message is acknowledged, it moves to the top part.

To set the messages acknowledgement and indication options, select ODU\MESSAGES... menu item: “Message Options” dialogue box will appear on the screen.

Note: This is a privileged operation. You will need “Changing of message options” privilege to perform it.

Select “Messages” tab and make the following settings:

- turn on/off “Acknowledge automatically after” check box to turn on/off the option for the automatic acknowledgement of messages and alarms, also use the appropriate spin box to set the interval of automatic acknowledgement of alarms;
- in “Keep acknowledged messages” spin box set the maximum number of expected displayed acknowledged messages and alarms;
- in “Keep not acknowledged messages” spin box set the maximum number of displayed unacknowledged messages and alarms.

2.9.7 To Set the Parameters of Sound Warning

To set the parameters of sound warning use the following procedure:

- select ODU\MESSAGES... menu item: the screen will display “Message Options” dialogue box;
- select “Sound” tab and use the radio buttons to select the type of acoustic indication of the messages and alarms.

2.9.8 Setting the Fonts

To select a font used for presenting information on the Information Panels use the following procedure:

- select ODU\FONTS... menu item: “Font” dialogue box will appear on the screen;
- use the keyboard for the input of font name in “Font” text box or select the font name from the list;
- use the keyboard to enter the font style in “Font style” text box or select a font style from the list;
- use the keyboard to enter the font size in “Size” text box or select the font size from the list;
- confirm that the entered data is correct and press “OK” button.

2.9.9 Setting Radar Image Colours

The radar image colours are set in the `RdrCols.ini` file which is located in the folder selected for the NH software installation. The RadarVideoLevels variable in the [Mode] section sets the number of brightness level.

Below is an example of such file:

[Mode]

RadarVideoLevels=15

In the absence of this file default values are used to set radar image colours (by default RadarVideoLevels is equal to 7).

Note: To set the radar image colours on all ODU and Playback ODU of the system one should edit the `RdrCols.ini` file on the corresponding computers.

2.9.10 Setting the Printing Options

To set the printing options select “Printing” tab of “Chart Settings” dialogue box and make the following settings:

- set the printing options in “Options” box;
- use radio buttons of “Area fills” box to set the area fill printing options;
- use “Symbol zoom” spin box to set the symbol zoom.

Printout quality selection is controlled by PrintWithScreenQuality parameter in [Mode] section of `Nharb*.ini` configuration file. The possible values are:

1. PrintWithScreenQuality=Auto (default value) – if in S57 chart printout area, charts are printed as a raster image with the screen resolution. Otherwise, the printing out is made with standard quality.
2. PrintWithScreenQuality=Low – charts are always printed out as a raster image with the screen resolution.
3. PrintWithScreenQuality=High – printout with standard quality.

As S57 charts are printed out, it is not advisable to use High parameter value.

2.9.11 The Use of Intellimouse Capabilities

The term Intellimouse is used for defining the class of mouse manipulators fitted out with a wheel. The use of such manipulators provides some additional facilities for work with a chart window, specifically:

- vertical and horizontal scrolling for viewing the window contents;
- automatic scrolling in the direction the of the cursor position.

For the use of the aforementioned facilities, adjust the ODU program in the following way:

- open “Chart Settings” dialogue window (CHART/SETTINGS menu item);
- switch to “Window” tab and check “IntelliMouse support” checkbox (unchecked by default).

In addition, open “Mouse Properties” dialogue and set the following capabilities:

- for Browsing Speed parameter select “Scroll 1 line at a time” (for Genius mouse manipulators on “Magic” tab, for Microsoft mouse manipulators on “Wheel” tab).

Note: The increase of Browsing Speed parameter corresponds to the faster scrolling of the window contents.

- AUTOPANNING/AUTOSCROLL with a press on the wheel (for Genius mouse manipulators on “Settings” tab, for Microsoft mouse manipulators on “Buttons” tab).
- for Genius mouse manipulators select NetScroll mode on “Settings” tab.

Note: The correct operation of the functions described above is guaranteed for the following types of mouse manipulators/drivers:

- Microsoft/Microsoft IntelliPoint v 11.30;
- Genius/Genius NewScroll v 4.11.00;
- Genius/Genius NetScroll+ v 4.16.00.

2.9.12 Alternative Datum

Transas electronic charts supplied as part of the Navi-Harbour system are based on WGS-84 datum.

The Navi-Harbour software supports the use of an alternative geodetic datum which can be set in `NharbN.ini` file or direct in “Chart Settings” dialogue window.

If an operator uses paper charts based on another ellipsoid model, for the object coordinates to coincide on the paper charts in use and the Navi-Harbour system charts, an appropriate geodetic datum should be selected.

The geodetic datum is set by latitude and longitude offset. If an alternative datum is selected, electronic chart coordinates are corrected with the offset. The chart objects properties display corrected coordinates.

To Set Geodetic Datum in Configuration File

To enable the use of an alternative datum, open `NharbN.ini` file and create the following section in it:

[AlternativeGeodeticBase]

DisplayName= name

LatitudeOffset= XX.XX

LongitudeOffset= XX.XX,

where LatitudeOffset and LongitudeOffset are floating variables, which set shifts for the latitude and longitude coordinates in seconds.

Datum Selection

Open “Chart Settings” dialogue window (CHART\SETTINGS menu item) on “Coordinates” tab, and perform the following procedure in “Geodetic base” section:

- in the opened list box, select the name of the datum:
  - “WGS-84” corresponds to the default geodetic datum;
  - “Custom offset” allows the setting of an arbitrary latitude and longitude offset:

    enter the required latitude and longitude coordinate offset values in seconds in “Latitude” and “Longitude” boxes.
  - “<Name>” corresponding to the geodetic system set in `NharbN.ini` file.
- press “OK” button.

2.9.13 Check of the Navi-Harbour System Operation

Before starting the check, ascertain that the following has been performed:

- all the ODU programs installed, general system and individual settings made;
- all the sensors installed and adjusted;
- all the Navi-Harbour software settings made for the operation with sensors (required VTS chart objects created, necessary sensors added to the sensor configuration);
- where VTS network planning is required, proxy programs installed and set up, VTS network configuration set, correctness of routing checked;
- additional hardware and software (if used) installed and set up.

The objective of the operation check is to ascertain that the data from each sensor is delivered to the appropriate consumers of this information.

You should first of all check that the following components have been run:

1. ODU 0:
   - set VTS “Operation” mode on this ODU;
   - turn on the display of all the video and targets data (check the checkboxes in “Radar Image” checkbox – CHART\OVERLAYS\RADAR... menu item).
2. All the sources of information (see sec.12.2.1).
3. All the consumers of information (see sec.12.2.2):
   - turn on the display of all the video and target data.
4. All the proxies (if used in the system – see Chapt.12).

ATTENTION!

The check should be made for each system ODU.

Network Connection Check

Check that the Message window of the ODU which is being checked, displays no messages about the impossibility to establish network connection, and that there are no red lamps on the sensor status diagnostics panels.

Data Delivery Check

For each sensor of Direction Finder, Transas ORS-2, Transas ORS-3 and VHF Transponders class used in the system, it is necessary to check if its data is delivered to the consumers.

For Direction Finder Class Sensors

Check visually that the Chart Window displays the direction finder beam, and there are no error messages related to the direction finder in the Message Window. If the beam cannot be seen, refer to Chapter 15 and try to cure the situation following the directions provided in this chapter.

For Transas ORS-2 and Transas ORS-3 Class Sensors

Check visually that the Chart Window displays radar video and initiative targets from each sensors in the Message Window. If there is no radar picture, refer to Chapter 15 and try to cure the situation following the directions provided in this chapter.

For VHF Transponders Class Sensors

Check visually that targets of a VHF Transponder class sensors are acquired, and there are no error messages related to the checked sensor in the Message Window.

If you find out that data from a certain sensor in a system using proxies, is not delivered to the consumer, identify the network segment where the problem occurred (see sec.12.6).

2.9.14 Getting Information on the Program

To obtain information on the program, select HELP\ABOUT menu item: the screen displays a dialogue box specifying the name of the program (Transas Navi-Harbour) and number of the current version and providing copyright information.

2.9.15 User Chart File Format

For faster reading and recording of a User chart file (UserChart.drw) binary format is used. The format type is controlled by UserChartFmt variable in [UserChart] section of `NharbN.ini` file, possible values are binary (by default) and XML.

To convert XML format to binary, edit `NharbN.ini` file during the operation of ODU N program.

2.9.16 Controlling the Logging Procedure

Record Server is a dedicated software module designed for recording the following tracks:

- “Config” – configuration parameters;
- “Events” – data on editing the Events chart;
- “DF <name>” – direction finder output;
- “Radar <name> (Video)” – raw radar picture;
- “Radar <name> (Targets)” – initiative targets (for Transas ORS-3 sensor only);
- “Status Messages ID” – information messages on the ODU ID system’s current status and alarms (operation of the system components, sensor status, etc.);
- “Targets” – positions and motion vectors of targets, fixed targets, tracked buoys. Recording of alarms associated with targets;
- “AIS Text Telegrams” – sent/received telegrams contents;
- “Audio <name>” – data transferred through the audio channel;
- “Transponder <name>” – transponder output data;
- “Container <name>” – Container data;
- “ODU ID”, where ID is equal to 0,1,… – changes in the Configuration and Desktop of ODU ID, data on the use of ERBL tool on the ODU ID and on the use of the prediction mode;
- “HM <name>” – Hydro-Meteo sensor data.

Recording of any track except for the Config track can be turned on/off. Since the raw radar picture track occupies a considerable amount of space, it is not advisable to turn on this track recording unless this kind of information is required.

To avoid problems in the registration and playback of “ODU ID” tracks, clocks of different ODU’s should be synchronised (setting of the time synchronising system is described in sec.12).

ATTENTION!

Logging control operations refer to the privileged operations and require “Logging control” privilege.

Operating Principle

As recording is turned on, a file is automatically created for each track type, and information is recorded in it. All the track files are combined into a logging volume stored in a set folder. It is possible to create several logging volumes of equal size.

After a pre-set fragmentation interval (“Fragment limitation”) the recording into the file is stopped and a new file is created. The process of creating new files continues until the limitations set for the logging volume are reached (“Logging Volume Settings”). As a volume is exceeded, “Logging Volume Size Exceeded” alarm is generated, whilst a yellow lamp lights up on the Main units diagnostics panel in “Logging” line:

- if “Folders” list of “Logging Storage“ dialogue window contains a single folder:
  - the program looks through the tracks in the order of their generation and tries to delete them;
  - if a track is being played back on one of the ODU’s, the deleting of such track is postponed until the next request to free space;
  - the found track is deleted and replaced with a new one.
- if “Folders” list of “Logging Storage“ dialogue window contains several folders:
  - recording is started in the next folder from the list.

The process is repeated automatically and requires no operator input. All the files except the one where the recording is currently made, are available for playback on any ODU.

During the recording of new tracks, the program checks, over regular intervals, if any free space is available on the disks with archive volumes. If the amount of free space on one of them is less than the set value, the user will be notified as follows:

- the Message window displays “Low disk space on the record volume” message;
- on the diagnostics panel of the Main components a yellow light lamp will light up for “Logging” line corresponding to the track recording subsystem in “Status” column (“Connection” column is not used);
- “System Status” window will display a warning in Record Server\Logger\Logger Warning item.

The check interval is set in seconds by SpaceWarnInterval variable in [Storage] section of `Logging.ini` file. Limitation on the amount of free space is controlled by SpaceWarnLimit variable in the same section. Where the aforementioned variables are not available, default values are used: 300 seconds and 100 Mb respectively.

Note: For the archiving purposes, it is advisable to copy files regularly into an external storage, as some of them will be lost (replaced with other files).

Principles of Selecting Limitations

At the time of setting the logging parameters, a limitation on the size of recorded information (in Kb) should mandatory be determined. The time limitation (in [days; hrs; min] format) can be turned off. If the time limit is enabled, its value is required to be within 1 minute to 999 days range:

1. Limitations on the logging volume (“Logging Volume Settings”).

   The necessity to set limits in size is determined by the available volume of the archive storage only. It is necessary to specify the size of free space which is guaranteed to be there, as the overfilling of the disk may bring about the system failure. It is feasible to set and turn on the limitation in time if there is no need to store the information for more than a certain period. Maximal volume size can not exceed 1000 Gb.

2. Limitations on file fragmentation (“Fragment limitation”).

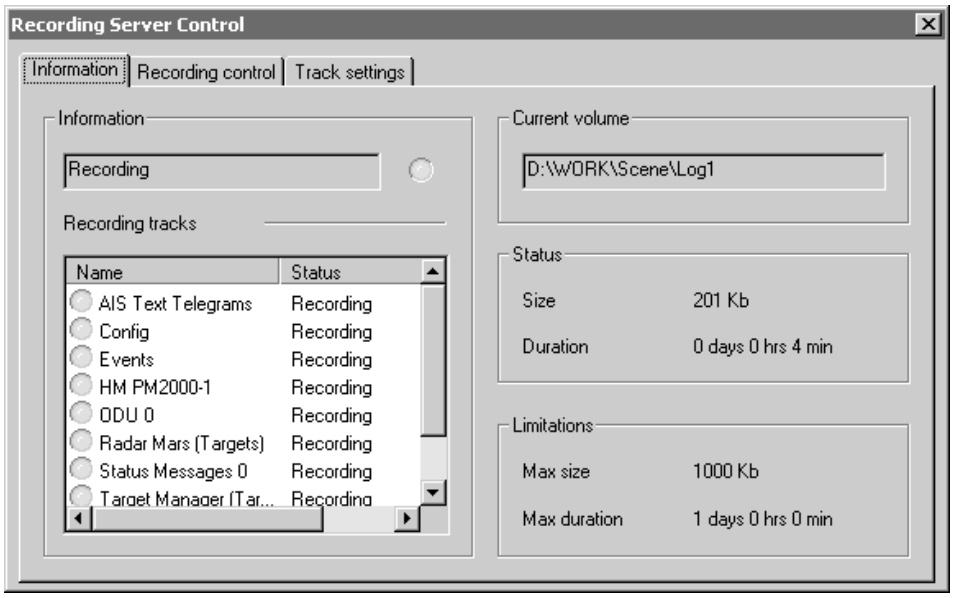
   This limitation is set for each track and is designed for dividing the recorded track into separate files. This kind of division allows enhancing the intactness of recorded data in case of failures. E.g., if a limitation on a logging volume is set at 24 hours, whilst “Fragment limitation” is one hour, the track will consist of 24 files (recording being made in one of them).

3. Frequency of recording of real-time information into a file (“Checkpoint condition”).

   This limitation determines the frequency of moments when a full set of data for a particular track is recorded into a file. In the intervals between these moments the system records only changes in the real-time data whose size is normally considerably smaller than a full set of data. When a track is re-played starting from some moment of time, the program finds the latest recorded full set of data before the selected moment and quickly renews it up to the required moment to start playing back. If “Checkpoint condition” settings are reduced, the track file considerably grows in size. At the same time it takes the program lesser time to find the position where to start playing back. It is recommended to use the default “Checkpoint condition” settings.

Logging Control

TO control the recording process, use the Record Server program window (a sample is provided in the drawing below) or the Record Server control panel in ODU 0 program.



To open the Record Server control pane at ODU 0, press “Recording panel” button or select LOGGING\RECORDING PANEL... menu item.

Control of the recording from ODU 0 is available in “Function” mode. With a change of mode, connection with the Record Server is broken.

In the absence of recording rights, Record Server window (and the server control panel) consists of a single “Information” page. To exit from the Record Server program, confirm the recording control rights.

To Obtain Permission

If the system uses a security mechanism (as described in sec.2.8.5), control of logging will require an appropriate access level:

- open “Access Level” dialogue box by using the following procedure:
  - in ODU 0 program, select ODU\ACCESS LEVEL...menu item;
  - In Record Server program, open the program window system menu and select ACCESS LEVEL... menu item.
- select a level which allows logging control and enter the appropriate password;
- press “OK” button.

Selection of access level requires the availability of a network connection with the VTS server (ODU 0 should be running).

As the Record Server program is exited, the current set of privileges is retained and is restored as the program is started next time.

To Change the Logging Storage Path

To change the logging storage path, check that the recording is stopped. Use the following procedure:

- switch to “Logging Control” tab;
- press “Volumes…” button: “Logging Storage" dialogue box will appear on the screen;
- select a path for the storage of log files from “Folders” list and press “Select” button;
- if a new folder is required to be added for the storage of log files press “Add” button.

Note: New volumes cannot be added at ODU 0 unless there is built in Record Server.

- if a folder for the storage of log files is required to be deleted press “Remove” command button;
- if a folder for the storage of log files is required to be changed, select a folder from the list, press “Change” command button and select a new folder;
- use “Up” and “Down” command buttons to change the position of some folder in the “Folders” list of “Logging storage” dialogue box.

To View and Change Logging Volume Parameters

- Switch to “Logging Control” tab;
- Press “Settings…” button: the screen will display “Logging Volume Settings” dialogue box:
  - set the limits on the size of the logging volume using the following criteria:

    maximum volume size in “Size” text box and/or
    maximum logging duration in time in “Duration” text box.

ATTENTION!

It is positively ill-advised to set the maximum volume size as equal to or larger than the size of the disk itself.

  - to switch on generation of the alarm when volume size limit exceeded earlier than volume duration limit, check the corresponding check box.

Note: Use “Duration” check box to enable/disable the limitation of the volume size in time.

To View and Change the Track Recording Options

- Switch to “Track Settings” tab;
- Select the track name from the list: the track logging settings are shown in the right hand of the panel.

ATTENTION!

To change logging settings, check that the recording has been stopped.

- To view and change the track recording options, select the track you are interested in from “Tracks” list and press “Settings…” button: the screen will display “Logging Track Settings” dialogue box;
- Use “Logging enabled” check box to turn on/off the logging of the track.
- Use the text boxes of “Fragment limitations” section to enter the values controlling the size of the given track recording fragment;
- Use the text boxes in “Checkpoint conditions” section to enter the values determining the recording parameters for the track;
- Press “OK” command button.

To Start/Stop Logging

1. To turn on logging, press “Start” button on “Logging Control” tab.
2. To turn off logging, press “Stop” button.

The logging is stopped automatically if there is loss of connection with VTS server and is resumed, as the connection is recovered.

Recording Error Diagnostics

Corresponding to each track used for recording in the Logging Mode is its own item in “System Status” window displayed by components (press on “+” sign to the left of Record Server\Logger item). As there is a recording error on some track, the status of the corresponding Logger\<track_name> item is changed for error. If an error occurs at the moment of the recording start, the recording does not start.

To Stop Record Server Operation

To stop operation of the Record Server, perform one of the following steps:

- press <Alt>+<F4> keys in the program window, or
- select CLOSE item in the program system menu, or
- press “Close” button the right hand corner of the program heading.

As you exit from the program, confirm your logging control rights: use “Privilege Request” dialogue box to select an access level which permits the logging control and enter the password.

2.9.17 Setting VTS Operation Mode

Navi-Harbour VTS can operate in one of three modes: Function/Standby/Demo, which differ in the source if information they use. Modes are controlled via SUPERVISOR menu, which is available in any ODU of the system. VTS operation mode is switched for the entire VTS system simultaneously:

1. “Function”.

   Data from all the available sources of real-time information can be processed;

2. “Standby”.

   No real time data or its imitation is processed. This is a service mode, which is intended primarily for the use by technical personnel during the installation, tests and servicing of VTS;

3. “Demo”.

   Previously recorded data from the real-time data sources are processed. When this mode is turned on, all the ODUs’ of VTS system will be receiving test-input information generated by a special built-in software component.

Note: Changing of VTS operation mode is a privileged operation. You will need “VTS Operation modes” privilege to perform it.

To set VTS operation modes, select one of the following menu items on any of the ODU:

- SUPERVISOR\STANDBY to switch to Standby mode;
- SUPERVISOR\FUNCTION to switch to Function mode;
- SUPERVISOR\DEMO to switch to Demo mode.

2.9.18 Operating System Automatic Reboot

In case some fatal errors occur in the ODU 0 program, there is a facility for rebooting automatically the operating system of the ODU 0 computer. This facility is adjusted in `Nharb0.ini` configuration file by using the following procedure:

Create [Mode] section where RebootOnError=1 or RebootOnError=on string should be added.

The aforementioned capability is ignored in the debug mode (when [Debug] section specifies that DebugMode=1).

Note: To reboot the operating system adjusted as described above, Windows user should have an authority to reboot the system.

2.9.19 Printer Recommended Settings

It is possible to use a single printer for the whole system by sharing it among the computers.

To speed up the output of printing and minimise the probability of any inaccuracies, the following parameters should be set in “Printer Properties” dialogue box for the connected printer:

- in “Scheduling” tab turn on “Spool print documents so program finishes printing faster” radio button. Do not use “Print directly to the printer” parameter, since it renders the Navi Harbour program impassive for the whole time of printing;
- ascertain that “Always spool RAW datatype” check box (on “General” tab of “Print Processor…” dialogue box) is unchecked. Otherwise this parameter may slow down the printing;

Set the following parameters in “Advanced” tab of the “Document Defaults” dialogue box:

- set “Print text as graphics” parameter. (Note: In some models of laser printers, printing without the setting of “Print text as graphics” parameter causes incorrect text data display in the places of chart intersection);
- set “Metafile Spooling” option.

In the printing out of user charts on HP printers, it is advisable to select the best possible printing quality (Best quality).

2.10 CONFIGURING PLAYBACK ODU

The Playback ODU setup is made after:

- installation of the Navi-Harbour software and electronic charts;
- making of general system settings at ODU 0 (see sec.2.8);
- installation and adjustment of sensors.

2.10.1 Running Playback ODU

To run Playback ODU use either of the following procedures:

- make a double-click on Playback ODU icon or

- select START\PROGRAMS\NAVI-HARBOUR 3.7\PLAYBACK ODU menu item.

2.10.2 Initial Run of Playback ODU

Check if the dongle is connected to the parallel computer port (LPT).

Run Playback ODU as described in sec. 2.10.1 of this manual:

1. Perform the steps listed in items 1-6 и 9-17 of sec.2.9 at Playback ODU except for the radar selection (see item 5 below).
2. Change the playback panel location on the screen if required (see sec.2.10.3 of this manual).
3. On ODU 0 record a track with radar data (see sec.2.9.16 of this manual).
4. Select the playback source (see sec.2.10.4 of this manual).
5. Select the radar (radars) whose picture should be presented in the Chart Window. (See **OPERATOR DISPLAY UNIT USER MANUAL** sec. 4.4.2 for the details).
6. Switch on playback of the recorded fragment. Check that the recorded data is played back correctly.

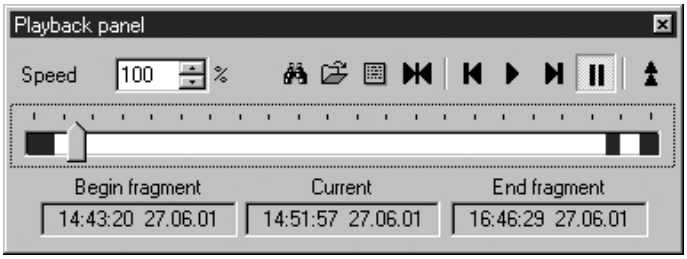
2.10.3 Playback Panel

Control of the Playback process is via the Playback panel. When the program is run for the first time, the panel is in the top left corner of the Chart window. If the panel is required to be moved to another place, use the mouse: click the left mouse button on the heading and, without releasing the mouse button, move the panel to a suitable place, then release the mouse button.

To open/close the Playback panel, use one of the following procedures:

- select PLAYBACK\PLAYBACK PANEL... menu item or
- press “Playback panel” button.

The drawing below shows the Playback panel in its expanded form (with the indication of the current time, as well as the recording start and end time):



The sliding bar is used to denote the selected fragment in the following way:

1. Blue plots correspond to those time periods during which the recording took place.
2. White plots correspond to periods when no recording took place.
3. The slider position corresponds to the current position of reproducing device in the selected fragment.

2.10.4 To Select the Playback Source

To select the playback source use the following procedure:

- press the “Source” button on the playback panel or select PLAYBACK\PATH... menu item: the screen will display "Open" dialogue box;
- select the path for playback files;
- press “Select” command button of "Open" dialogue box.

Note: Make sure the selected path is complete, i.e. it starts from the name of the computer where playback files are stored.

After the selection of the of the playback source, data is read from the selected volume, whilst the screen displays a window with the reading process indicator.

2.10.5 List of Current Playback Tracks

To view playback tracks contained in the selected volume which correspond to the current position of playback panel slider, press the “Tracks” button on the Playback panel or select PLAYBACK\TRACKS... menu item: the screen will display "Playback Tracks" dialogue box.

“Tracks” list contains tracks of two types:

1. Tracks currently available in the recording.
2. Tracks which were played back from the moment when the volume was opened until the current moment.

Tracks of the first type are shown in the bold type. Tracks which are contained in the volume but are currently not available in the recording are shown in the regular type.

Note: If the selected volume contains no recorded tracks then “Tracks” list consists of Config, Events and Targets tracks.

2.10.6 Selecting Tracks for Playback

When a recorded fragment is played back, the playback of any track except for the Config track can be switched on/off:

- open the "Playback Tracks" dialogue box (see the preceding paragraph);
- in “Tracks” check list box check/uncheck the checkboxes of those tracks which are required to be switched on/off.

For a track available in the recording, changes in the checked/unchecked status manifest themselves immediately, whilst in case of tracks which are not currently available in the recording, this change will manifest itself during the next playback of a fragment where such tracks are available.

Note: Current status of a check box (checked or unchecked) is stored and retains till next replay.

2.11 SETTING OF SYNCHRONIZATION

If the Navi-Harbour/Navi-Traffic system includes more than one computer executing the Navi-Harbour software (several ODU's, ORS radar processor computer, Audio Information Server), to operate the correctly, the software REQUIRES time of all the computers to be synchronised with the time of ODU0/System server computer.

2.11.1 General Approach to Building up of the Time Synchronising System

It is worthwhile to use the following approach to the organisation of the time synchronising system for the VTS computers:

1. If the external time standard is not available in the system, all the VTS computers are time synchronised with the ODU0/System server.
2. If there is an external time standard in the system (satellite Time Server or other high accuracy sources of time data), it is advisable to organise the time synchronising in two stages:
   – 1st level: ODU0/System server is synchronised with the external time source;
   – 2nd level: the rest of the VTS computers are synchronised with the ODU0/System server.

Such configuration will ensure the system operation even in case of the external time source failure.

2.11.2 Time Synchronising System Software

The following software can be used for the time synchronising of computers:

1. Microsoft Time Server (recommended).
2. Synchronising component from the Navi-Harbour software package.

Use of Microsoft Time Server

It is recommended that the Microsoft Time Server should be used for the synchronising of VTS computers. You can familiarise yourselves with this software installation, setup and start procedure, and load Microsoft Time Server software on the following WEB page:

http://www.microsoft.com/technet/treeview/default.asp?url=/TechNet/prodtechnol/winntas/downloads/W32TIME.asp

Use of the Navi-Harbour Synchronising Component

Where it is impossible to use the Microsoft Time Server the time synchronising of VTS computers, the Navi-Harbour software synchronising component can be used.

All the Navi-Harbour synchronising component does is synchronising of computer clocks, but it does not ensure synchronising with the external time standard. For this purpose, use dedicated software which is, as a rule, delivered together with the device.

ATTENTION!

To use the Navi-Harbour synchronising component, all the VTS computers are required to be in a single subnet.

To run the time synchronising system, use the following procedure:

1. On ODU 0 run `SyncServ.exe` program from the folder where the ODU software is installed. For the program to be run automatically at the computer start, add `SyncServ.exe` shortcut to the Startup menu.
2. On the rest of VTS computers run `SyncClnt.exe` program from the folder where the ODU or ORS software is installed. For the program to be run automatically at the computer start, add `SyncClnt.exe` shortcut to the Startup menu.
3. Check the time synchronisation operation in the following way
   - among the programs run on the ODU 0 computer find a program with “Master Clock” window heading and check which of the computers receive the time data: all the time server clients are listed in the “Echo” section;
   - on each of the time server client computers among the run programs find a program with “Slave Clock” dialogue box and ascertain that the name of the computer where `SyncServ.exe` is operating is entered in “Name” text field of “Server” section. Check that the value in Updated field is rest to zero approximately every 10 seconds.

2.12 FINISHING WORK ON ODU COMPUTER

Before shutting down the computer close Navi-Harbour programs (both ODU and Playback ODU).

During the exit from ODU 0 program, the system inquires about the access level which permits the closing of the VTS server, and requests to enter the appropriate password. Select the required level from the list and enter the password for exiting the program.

2.13 SYSTEM BACKUP

To ensure the fastest system recovery in case of failure or damage of ODU hard disk, it is advisable to regularly save the system current configuration on a detachable device or in some other archiving device. To do this, you should use BackUpCfg Configuration Saving and Restoration Utility as described in sec.2.13.1 of this Manual.

`BackUpCfg.exe` configuration saving/restoring utility is a software application designed for saving and re-constructing configuration of any of the following products: Navi-Harbour, ORS, Navi-Harbour Remote Terminal and VTSDB Client.

The utility can be used for:

- making a copy of an existing component installation;
- reconstructing a component of an installation which existed before in case of some erroneous changes;
- emergency reconstructing of a component installation in case of the hard disk damage or failure.

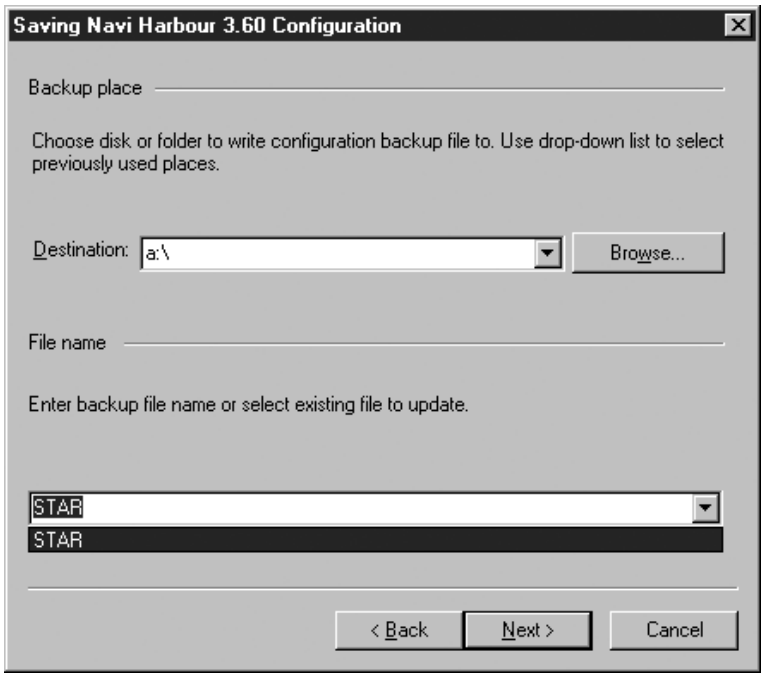
ATTENTION!

To be able to work with BackUpCfg utility it is necessary to complete execution of the VTS software component whose configuration is expected to be saved or reconstructed.

2.13.1 Saving of System Configuration

To create a system backup copy in the form of a configuration backup file, use the following procedure:

- run the configuration saving utility:
  - select START\PROGRAMS\<FOLDER>\SAVE AND RECONSTRUCT CONFIGURATION menu item where Folder is group name selected for the installation of Navi-Harbour product (or any other product whose configuration is required to be saved).
- press “Save” button: a dialogue window shown on the drawing below is displayed:



- in “Backup place” section, specify the configuration backup file storage place using one of the following procedures:
  - select a folder in “Destination” drop down list (default implies the last previously used path, if the file is first created – disk a:\) or
  - enter the required path via the keyboard, or
  - press “Browse…” button to select another folder.
- in “File name” section, set the name of the configuration backup file:
  - enter a new name via the keyboard (a new file will be created in the selected place) or
  - from the drop down list select one of the already existing file names (in this case, the file will be overwritten).

Note: By default, the computer name is offered for the configuration backup file name.

- ascertain that the file storage folder and file name have been selected correctly and press “Next” button;
- after the display of “The configuration successfully saved” message, press “Finish” button.

After the successful completion of the utility operation, a file with a name of <file name>.<product ID>.<version number><sub-version number>.VCB type, e.g, Star.NH.3.70.vcb. The following notations can be used for the <product ID>: NH (for the Navi-Harbour), ORS (for the ORS), NHRT (for the Navi-Harbour Remote Terminal) and VDC (for the VTSDB Client).

2.14 ODU RE-INSTALLATION

ATTENTION!

Whenever a computer with the Navi-Harbour software installation is subjected to any operations connected with changes in the network equipment configuration and/or TCP/IP protocol features, re-install the Navi-Harbour software.

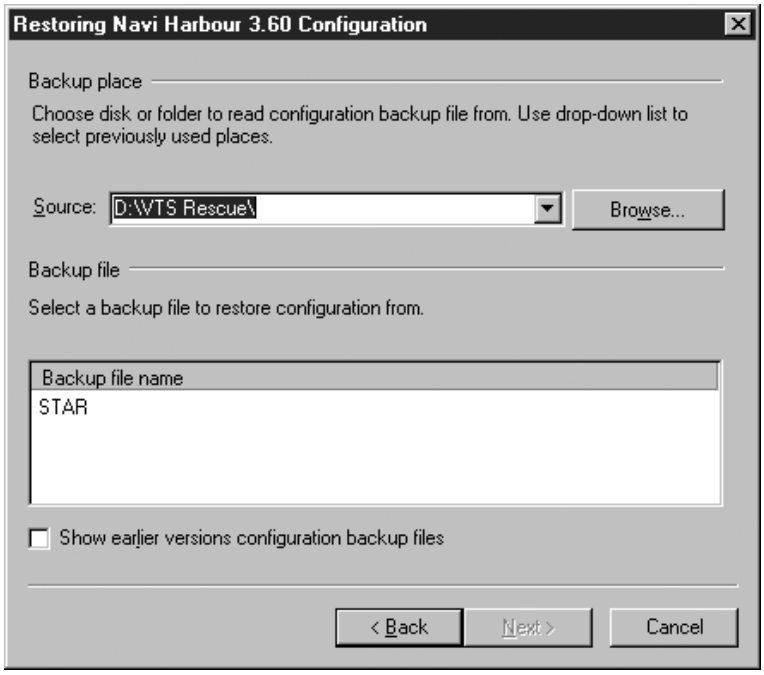
To re-install Navi-Harbour program (to install the same version) without any loss of information accumulated during the program's operation (log files, edited electronic charts, settings files), perform the following procedure:

1. Uninstall Navi-Harbour program:
   - make a mouse double click on "Add/Remove Programs" icon on the Control Panel;
   - select "NaviHarbour 3.7" line from the list of programs;
   - press "Add/Remove…" command button.
2. Delete the folder where Navi-Harbour was installed (e.g, *C:\NH37*) with all its subfolders from the disk.
3. Install Navi-Harbour using the procedures detailed in section 2.5 (e.g, in *C:\NH37* folder).
4. Restore the Navi-Harbour configuration from the Configuration backup file as described in sec.2.14.1).

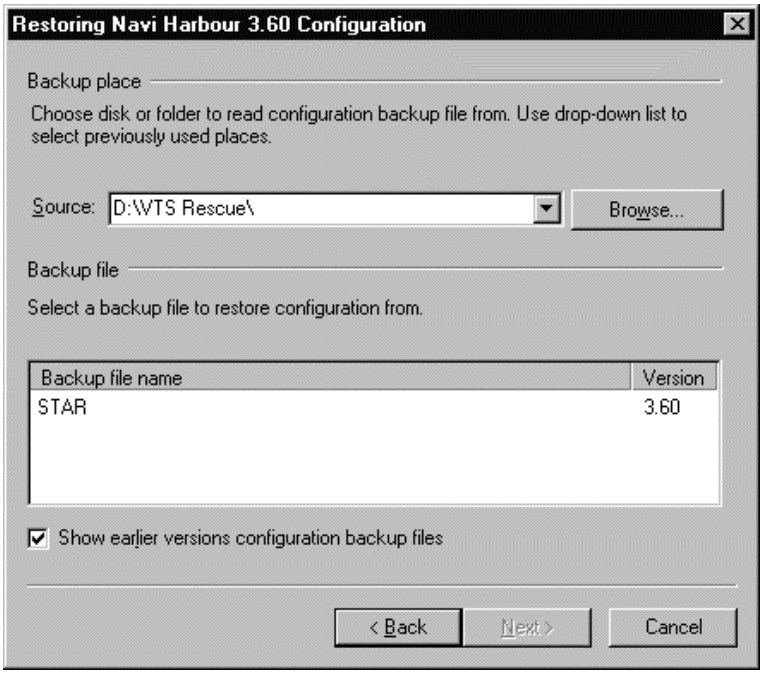
2.14.1 Reconstruction of a Configuration from a File

To reconstruct a previously saved configuration of one of VTS software components, use the following procedure:

- run the configuration saving/restoring utility;
- press “Restore” button: the screen displays “Restoring <VTS software component name> Configuration” dialogue window a sample of which is provided on the drawing below:


Restoring Navi Harbour 3.60 Configuration
Backup place
Choose disk or folder to read configuration backup file from. Use drop-down list to select previously used places.
Source:
D:\VTS Rescue\
Browse...
Backup file
Select a backup file to restore configuration from.
Backup file name
STAR
Show earlier versions configuration backup files
< Back
Next >
Cancel

- in “Backup place” section specify the place where the configuration saving file is stored:
  - from the drop down “Source” list, select the disk or folder where the configuration saving file(s) is/are stored, or
  - enter the required path via the keyboard, or
  - press “Browse…” button to select another folder.
- in “Backup file” section, select the name of the file which will be used for restoring the configuration:
  - to select a file for saving the current component version configuration, ascertain that “Show earlier versions configuration backup files” checkbox is unchecked;
  - if it is necessary to select an earlier version configuration backup file, check “Show earlier versions configuration backup files” checkbox.



ATTENTION!

During the switch to another version, compatibility of VTS software component configurations is retained. In the reconstruction of an earlier version configuration, part of information can, nonetheless, be lost.

- ascertain that the storage folder and file name have been selected correctly, if not, press “Back” button, return to the previous step and make the necessary changes;
- press “Next” button to start the process of restoring configuration from the file;
- when “The configuration successfully restored” message is displayed, press “Finish” button.

2.14.2 License Re-installation

To prolong the license term or to extend the system’s licensed capabilities, the license can be re-installed. To do this, perform the following steps:

- save the current configuration of the Navi-Harbour program (see sec.2.13.1);
- re-install the program by using the procedure detailed in sec 2.14 of this manual, using a new license in the process.

CHAPTER 3

Radar Processor ORS3

This chapter contains necessary information for handling ORS3 Radar Processor.

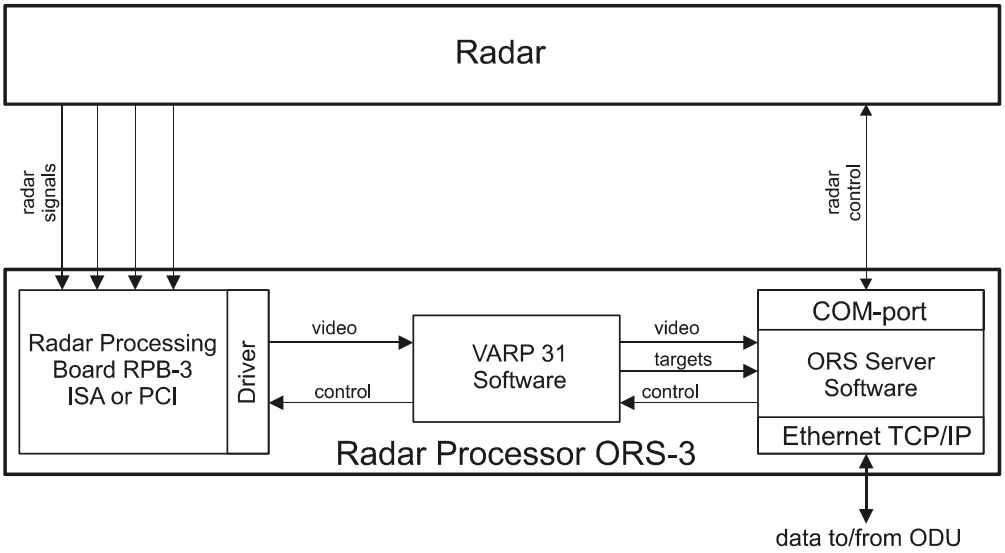
Copyright Transas Marine Ltd., 2003

3.1 GENERAL

ORS3 radar processor is a powerful PC compatible computer operating under the control of Windows 2000 OS, with Transas dedicated Radar Processing Board 3 (RPB3) and dedicated Transas software installed in it.

3.2 GENERALISED STRUCTURE OF ORS3 RADAR PROCESSOR

The drawing below shows Transas ORS3 radar processor structure:



According to this structure, the following dedicated hard- and software components should be installed on ORS3 computer:

1. ISA or PCI RPB3 card.
2. Driver of ISA or PCI RPB3 card.
3. VARP31 software.
4. ORS server software.

3.3 COMPUTER AND OS REQUIREMENTS

3.3.1 ORS3 Computer

For the radar processor, prepare a computer meeting the requirements set forth in this paragraph and install Microsoft Windows 2000 English/US version SP 2 on it.

For ORS3 radar processor to operate normally, the computer should meet the requirements specified in the table below:

Characteristic	Minimum requirement	Recommended
Processor	PIII/600 MHz	2x PIII/950 MHz
RAM	128Mb	256 Mb
Video adapter	4Mb AGP or PCI	8Mb AGP or PCI
Hard disk	4Gb	
CD drive	Required	
Free slots	1xPCI or 1xISA depending on RPB3 type	
Network adapter	Ethernet/Fast Ethernet	
Operating system	Windows 2000 SP2 English/US version	
Maintenance monitor	15'', 1024x768/75Hz	
Keyboard, mouse	Standard	
RS-485 interface	Necessary if BridgeMaster II radar is required to be capable of being controlled	
Watchdog	Type: Advantech or WDT-01. Necessary if the processor is required to be installed at an unmanned site	
Free hardware resources	IRQ10, DMA5 for RPB3(ISA) not required for RPB3(PCI)	

The Watchdog enables the ORS radar processor to restore itself automatically in case of all kinds of failures. This capability enhances the radar processor's fault tolerance. It is essential when the ORS is installed at an unmanned site, and the manual restart is rather problematic.

3.3.2 Operating System Installation

Materials Required: installation license Microsoft Windows 2000 Service Pack 2 CD;

Radar processor software operates under Microsoft Windows 2000, English/US version, Service Pack 2. Installation of the operating system should be made by a qualified specialist holding an appropriate Microsoft certificate. Follow an appropriate installation instruction provided by Microsoft Corporation. The following components should be installed:

- Video adapter driver;
- Network drivers for all network adapters installed in this computer;
- TCP/IP protocol.

For TCP/IP or "Workgroup"/"Domain" settings consult your network administrator.

Special Case of Two Computers

If only two computers are connected to your network (ODU and ORS), a simplified procedure for setting IP addresses described in sec.2.4.1 can be used,

Note: Upgrade the operating system with Service Pack 5 if some earlier edition of Service Pack is installed or is not installed at all.

Check of Network Software Adjustment

To check the correctness of IP address setting and to find out the IP address when it is received from the DHCP server, use the following procedure:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ipconfig” and press <Enter>.
3. List of IP addresses for every network adapter will be shown.

Check of TCP/IP Connection

Check that TCP/IP connection between radar processor computer and ODU 0 has been established. To check TCP/IP connection between two computers use the following procedure for the both computers:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ping IP_ADDRESS” where IP_ADDRESS is the IP address of another computer, and press <Enter>.
3. Check that other computer responds to the requests. In this case the screen should display “Reply from IP_ADDRESS:” messages.

Creating Radar Processor User

To enable the automatic Radar Processor (RP) login, create RP user by using the procedure detailed below:

1. Login to operating system Windows as Administrator.

ATTENTION!

If START\PROGRAMS\ADMINISTRATIVE TOOLS menu item is not displayed, click the right mouse button on the task panel and select PROPERTIES from the context menu. In “Taskbar and Start Menu Properties” dialogue box, switch to ”Advanced” tab where you should check “Display Administrative Tools” checkbox.

2. Select START\PROGRAMS\ADMINISTRATIVE TOOLS\COMPUTER MANAGEMENT menu item: the screen will display “Computer Management” dialogue box:
   - in the tree on the left, select LOCAL USERS AND GROUPS\USERS item;
   - open the context menu and select NEW USER item: the screen will display “New User” dialogue box;
   - enter the User name and Full name in the appropriate text boxes (for example: Username="ORS"),
   - enter the password and confirm it (for example: Password="ors");
   - uncheck “User must change password at next logon” check box;
   - check “Password Never Expires” check box;
   - press ”Create” command button of “New User” dialogue box;
   - select LOCAL USERS AND GROUPS\GROUPS item;
   - double click the mouse on “Administrators” group in the list of groups: the screen will display “Administrators Properties” dialogue box;

– press “Add” command button: the screen will display “Select Users or Groups” dialogue box;

– select the newly created user in the list and press “Add” button;

– press “OK” command button of “Select Users or Groups” dialogue box to add a newly created user to the group of administrators.

3. Login to operating system Windows 2000 as ORS user.

3.4 INSTALLATION OF ORS3 HARDWARE

3.4.1 Assigning of ORS Computer Resources

Before installing RPB3 ISA card in ORS computer, make an interrupt and DMA channel assignment. To do this, open computer BIOS settings and set ISA Legacy value for IRQ10 and DMA5.

With the use of RPB3 PCI board, no assignment of the computer hardware is required.

3.4.2 RPB3 Board Adjustment

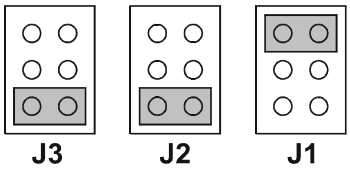
Before the installation of RPB3 board in the computer, check that the following settings are correct:

1. Set the selector of S2 address on RPB board in 0 position.
2. Set S1 attenuator to the position corresponding to the maximum video amplitude in accordance with the following Table.

Table 3-1

Maximum video amplitude, V	Attenuator code
1	4
2,6	3
4,3	2
7,5	1

3. Set J1, J2, J3 jumpers on the RPB board as shown in the drawing:



4. Set J4 and J5 jumper if the scan start marker signal is of IEA422 type.
5. Set J6 jumper is the azimuth signal is of IEA422 type.
6. Set J7 jumper is the synchro signal is of IEA422 type.

Note: With the use of ORS3 Interface Unit, set J4-J7 jumpers, as it converts all the signals from the radar to IEA422 format.

3.4.3 RPB3 Card Installation

Turn off ORS computer power supply and disconnect the power cable from the computer. Carefully insert RPB3 board in the free ISA or PCI slot depending on which board you are using, and fix it.

3.5 ORS3 SOFTWARE INSTALLATION

3.5.1 List of ORS3 Software Modules

The following software modules are required to be installed on ORS3 radar processor computer:

1. ORS Server program.
2. RPB3 ISA or PCI card driver.
3. VARP31 program.

In addition, with Navi-Harbour/Navi-Traffic system using ORS3 radar processors, it is necessary to install Integrator2 (Transas Target Manager) program on VTS Server\ODU0 computer.

3.5.2 ORS Server Program Installation

Materials Required

Navi-Harbour license distributive CD.

Installation Procedure

To install ORS software use the following procedure:

- run `SETUP.EXE` program from\ORS folder of distributive CD;
- when prompted to Choose Destination Location confirm the suggested path or enter the path of your own by pressing “Browse…” command button;
- when prompted to Select Program Folder confirm the suggested name or enter a different name;
- in “Autologon” dialogue box check “Enable Autologon” check box to avoid the password input during the loading Windows and enter the ORS user password in “Default Password” text box;
- use “Watchdog Type” dialogue box to select Watchdog type used in the ORS computer:
  - select “WDT-01” if the system board of the given type is in use and see documentation on the board to provide correct address in “Base address” spin box;
  - select “Advantech” if the system board of the given type is in use and enter in “Advantech Watchdog Properties” dialogue box the following parameters of Watchdog drivers:

    “Set watchdog” Port – 0x443;
    “Clear watchdog” Port – 0x443.

ORSSERV Program Re-installation

ATTENTION!

Whenever a computer with the Radar Processor software installation is subjected to any operations connected with changes in the network equipment configuration and/or TCP/IP protocol features, the Radar Processor software is required to be re-installed.

If ORS software is required to be re-installed without any loss of information about current hardware configuration, use the following procedure:

1. Uninstall ORS Server program:
   - make a mouse double click on “Add/Remove Programs” icon on the Control Panel;
   - select “ORS 3.7” line from the list of programs and press "Add/Remove…" command button.

Note: If for any reason the line “ORS 3.7” is not on the list of programs in the Control panel use a simplified procedure for the ORS software deinstallation. This procedure consists in removing ORSServer shortcut from the “Startup” folder and deleting from the disk of the folder where ORS software is installed.

2. Since after automatically removal the folder where ORS software was installed may contain some files (namely, `*.dat` files and `NHRdMon.cfg` folder), remove them from the disk manually.
3. Re-install ORSSERV program using the procedure described in sec. 3.5.2 of this Manual.
4. Restore the ORS configuration from the Configuration backup file (see sec.2.13.1 of this Manual).
5. Re-start Windows 2000.

Note: When run for the first time, ORSSERV program starts operating in “Run” mode, selection of the Control Set is made automatically.

3.5.3 RPB3 Driver Installation

For RPB3(ISA)

Open *\RPB_3\RPB-3_Driver\ISA_Extractor_DRV* folder and run `V3_setup.exe` program.

For the driver installation restart ORS computer.

For RPB3(PCI)

Windows 2000 OS automatically identifies RPB3 (PCI) board as a new device and offers to install driver on it. At this stage, Installation Wizard of the new device is run automatically. Follow the Wizard’s direction and when requested, specify the path to the driver in\RPB3\RPB-3 Driver\VARP31\PCI Extractor DRV folder.

After the driver installation, in `VARP31.ini` file, select PCI card loading file:

[SE]

```
ConfigFile=.\r11*.ttf
```

3.5.4 VARP31 Program Installation

Copy the contents of *\RPB_3\VARP31* folder to the folder of the hard disk selected for the RPB3 software installation. After the copying, remove Read Only attribute from `VARP31.ini` file.

Open the folder where you installed VARP program and create a desktop shortcut for `Varp31.exe` program.

For the program to be run automatically when the computer is started, copy this shortcut to “Startup” folder.

3.5.5 Installation of Integrator2 Program at ODU 0

Install VARP program as described in sec.3.8.1.

3.6 RPB3 OPERATION CHECK

After the installation of ORS3 hardware and software, check RPB3 board operation. To do this:

- start ORS3 computer and run `Varp31.exe`. The screen should display a local monitor window.
- press “Access” toolbar button and enter the password. The default password is cooper
- switch “Off” Autotrack toolbar button and “On” button in Auto-threshold group, switch “On display” and “Test” buttons. The error code should be 0. If it is not, see sec.3.17 (1).
- select All option in Detection group on the control panel. Set “Sensitivity” value at 132. The PPI should display clear concentric dashed rings. If there are no rings, see item 2 in sec. 3.17.
- gradually increase “Sensitivity” value until the rings disappear. Up to the moment when they disappear, the clearness and width of the rings should be the same. If not, see item 3 in sec. 3.17
- turn off the test. The error code should change to 3Ch. Otherwise, see item 4 in sec. 3.17

3.7 ORS3 SOFTWARE COMPONENT SETTINGS

3.7.1 ORS Server Program Adjustment

`ORSServ.ini` and `Signals.cfg` configuration files are designed for the ORS server program adjustment.

Use `ORSServ.ini` file to make the following settings:

1. Select the type of the radar processor board in use.
2. Adjust network parameters as required.
3. Adjust radar control parameter (if the radar control is used).
4. `Signals.cfg` file is intended for adjusting the automatic switch of the radar processing parameters with the radar operating in Slave mode. In case of operation in Master mode, settings made in this file do not affect the ORS operation.

Selecting Type of Radar Processing Board

In [ORS] section, set ORSDriver = ORSDRVE for the operation with RPB3.

Network Parameter Adjustment

In most cases, no changes of default network parameters will be required, the procedure detailed in this section will, therefore, not performed unless the use of IP ports 3000 and 6000 is for come reasons undesirable.

To change the network settings, enter IP port value in [Network] section:

- BasePort = control port;
- ORS3Port= Vide and target transmission port.

If the port values have been changed, do not forget to specify these values when you create ORS3 type sensor at ODU 0.

Operating System Automatic Reboot

In the absence of Watchdog functionality should some fatal errors occur in the program, there is a facility for rebooting automatically the operating system of the computer where the radar processor is operating. This facility is adjusted in `ORSServ.ini` configuration file by using the following procedure:

Create [Mode**]** section where RebootOnError=1 or RebootOnError=on string should be added.

The aforementioned capability is ignored in the debug mode (when [Debug] section specifies that DebugMode=1).

Note: To reboot the operating system adjusted as described above, Windows user should have an authority to reboot the system.

If Watchdog functionality is available, these parameters need not be re-adjusted, as in case of this kind of errors, there is a reset of the radar processor computer.

Radar Control Parameter Settings

Radar control parameters are adjusted in [RadarControl] section of `ORSServ.ini` file.

If the radar processor is not used for the radar control (Slave mode), make the following settings:

- RadarType = None;
- ManualControl=0 if you use automatic switching of the processing parameters in accordance with `Signals.cfg` settings (see below), or
- ManualControl=1 it is necessary to switch the processing parameters manually (not advisable).

If the radar processor controls the radar, it is necessary:

- RadarType = to select the type of the radar which should be controlled, from the list provided in `ORSServ.ini` file;
- ManualControl= it is advisable to set to 0;
- In the section named after the selected radar type, set the necessary parameters. Description of each parameter is provided in comments to the relevant `ORSServ.ini` string.

Signals.cfg File Settings (for Slave Mode Only)

Automatic switching of the radar processing parameters is not possible unless the radar provides binary signals with information on the current pulse length and radar transmission status, and these signals are connected to the radar processor discrete inputs In1 – In4. If this information is not available, the switching of parameters may depend on PRF value. This capability can naturally be used if the radar has different PRF values at each pulse length.

`Signals.cfg` file contains a table which is used for selecting the number of the radar, pulse length number and the radar transmission status depending on the condition of inputs In1 – In4.

Before editing, carefully read the comments contained in the file and adjust all the parameters.

For the adjustment of switching parameters, analyse the code combination supplied by the radar and enter appropriate values in the table.

To use the switching by PRF value for the relevant code combination, delete P value (e.g, the string may have a form of Code0000=R1T2). It should be noted that for this code combination, the number of the pulse length will be determined by the current PRF hitting PRF1, PRF2, PRF3, PRF4 range determined at the end of `Signals.cfg` file.

Note: As PRF range is set, it is worthwhile to determine values for each pulse length from the corresponding field of “Statistics” tab of ORS Server tab, rather than from the radar certificate. After determining mean PRF values, set the range to both sides of the mean value with a sufficient margin for PRF instability.

If the pulse length is determined, there is switching to the set of parameters with the number: ((radar number-1)*4+(pulse length number -1)).

To prevent false switching, the automatic switch of a parameter set may occur with a delay: Delay variable of [Signals] section sets the number of successive identical readings required for the switching of a parameter set (by default, this value is equal to 2).

Example: the system uses 2 radars with binary signal with information on the currently active data connected to input In1. The pulse length is determined by PRF. The radar has three pulse lengths Short: PRF=3600, Medium: PRF-1800, Long: PRF=900. `Signals.cfg` settings:

Code0000=R1T2

Code1000=R2T2

PRF1=2800-4000

PRF2=1400-2700

PRF3=500-1300

PRF4=000-400 – not used.

Settings for Interaction with VARP31 Program

1. In [Network] section, set the path of VARP program.

   VARPPath=<path>.

2. In [Network] section, set the name of VARP program operating folder:

   VARPFolder=<name>.

Note: If the VARP program path and operating folder are set (as per items 1,2), during the start of the ORSServ, VARP program will be run automatically, whilst when the ORSServ is closed, VARP program will also close automatically.

3. In [ETS Config] section, set the parameters described below:

Parameter	Default value	Description
PingTimeout		Maximum interval (ms) between the diagnostic messages received by ORSSERV program from VARP
ResetOnTimeout	0	Control of OS reboot as PingTimeout value is exceeded: 1 – reboot; 0 – no reboot
ResetOnDisconnect		Control of OS reboot in case of broken connection between ORSSERV and VARP: 1 – reboot; 0 – no reboot
Port	8000	Number of IP port for the connection with VARP program

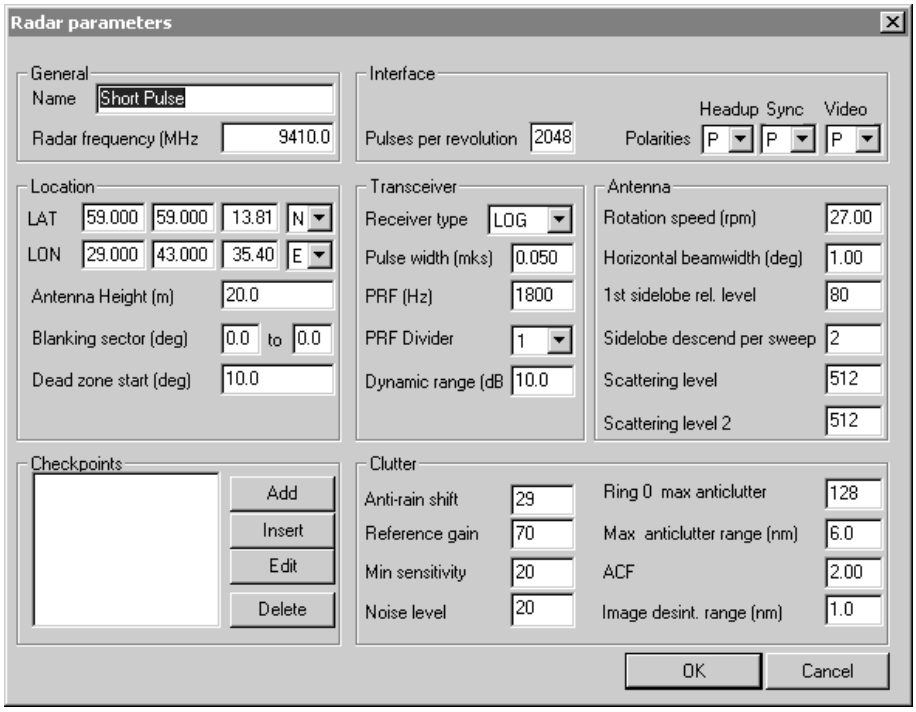
3.7.2 Adjustment of Main Radar Processing Parameters

1. The adjustment of the radar processing parameters is made in VARP31 program window.
2. Press “Access” toolbar button and enter the password. The default password is “Cooper”.

Select RADARS menu item. The dialogue box which will open up, provides a list of virtual radars. A virtual radar is any combination of actual radar parameters. The number of virtual radars is normally determined by the possible combinations of the pulse repetition rate and pulse length.

Note: ORS3 software is supplied with a list of three virtual radars named arbitrarily Short, Medium, Long.

To change the name of a virtual radar and its parameters, press “Edit” button.



In “Radar parameters” window which will open up, enter the following parameters values as appropriate for the radar specification:

1. Antenna Height – antenna elevation over the water surface.
2. Blanking sector – start and end of the transmission blanking sector.
3. Dead zone start – determines azimuth of the observation separation line. It is advisable to place this line at the beginning of the blanking sector, but not in the position of the observation start marker.
4. Polarities – polarity of signals of the radar electrical interface. Polarity of the observation start marker and synchro pulse is considered to be Positive for leading edge and Negative for falling edge. Video polarity is considered to be positive if a larger power of the received signal corresponds to a larger video value.
5. Pulses per revolution – number of azimuth count pulses (ACF) arriving during one antenna revolution.

6. Receiver type – type of the radar receiver amplitude characteristic (logarithmic or linear).
7. Pulse width – length of pulse transmitted by a virtual radar.
8. PRF – virtual radar pulse repetition rate.
9. PRF divider – sweep rate divider. With a larger transmitted pulse repetition rate, the range of the processed ranges is reduced. If this kind of reduction is not desirable, the sweep rate division is introduced.
10. Rotation speed – antenna revolutions per minute.
11. Horizontal beamwidth – antenna azimuth pattern at a level of 3 dB.

Other parameters not included in this list are loaded automatically by the VTS server to make up a group of ORS3 optimising settings and are considered in sec. 3.13.6. Their default values can be used at the start.

3.8 ODU0 SETTING FOR THE OPERATION WITH ORS3

Before starting to adjust ODU0 for the operation with the radar processor, check that the following has been done:

- Navi-Harbour software and electronic charts have been installed in the selected ODU 0 computer;
- During the making of general system settings, VTS configuration was set at ODU 0 (see sec.2.8).

To adjust the ODU for operation with ORS3 radar processor, use the following procedure:

1. Install Integrator2 (Transas Target Manager) program on ODU 0.
2. Create Transas Target Manager sensor.
3. Create “Radar” type VTS chart object (for more editing details see ODU User manual).
4. Create Transas ORS-3 type sensor as described below.
5. Edit individual sensor charts as described below in this paragraph.
6. Adjust the video and target data wait time (see sec.2.13.1 of this manual).

3.8.1 Installation of Target Manager Program

Transas Target Manager (`Integrator2.exe`) program is a mandatory component of the Navi-Harbour software where the system uses at least one of ORS-3 or Universal AIS type sensors.

On the basis of data received from all the ORS-3 radars and AIS transponders, the Target Manager performs the function of merging of the same targets tracked by different radars and the Universal AIS.

The data exchange between the Target Manager and ODU 0 programs is according to TCP/IP protocol. The port for the communication of these programs is set by Port variable in [General] section of `Integrator2.ini` file and Port variable in [ETS Config] section of `Nharb0.ini` file (default value is 9000).

Target Manager program is installed on ODU 0 computer. To install the program, use the Navi-Harbour distribution CD. Copy the contents of *\RPB_3\Integrator* folder to the hard disk folder selected for the Target Manager installation. After the copying, remove “Read only” attribute from `INTEGRATOR2.INI` file.

For the automatic running of Integrator2 program, place this program shortcut in “Startup” folder.

3.8.2 Creating Transas Target Manager Type Sensor

Edit sensor configuration on ODU 0 as described in. sec.2.8.7 to add Transas Target Manager type sensor.

3.8.3 Adjustment of Nharb0.ini file for the Work with Target Manager

Edit the values of special parameter in [ETS Config] section of `Nharb0.ini` file described below:

Name	Default value	Description
PingTimeout		Maximum interval (ms) between the diagnostic messages received from the Target Manager
ResetOnTimeout	0	Control of the OS reboot when PingTimeout value is exceeded: 1 – reboot; 0 – no reboot
ResetOnDisconnect		Control of the OS reboot in case of broken connection between ODU 0 and the Target Manager: 1 – reboot; 0 – no reboot
Port	9000	IP port number for the connection with the Target Manager program

3.8.4 Creating ORS-3 Type Sensor

Edit sensor configuration ODU 0 as described in. sec.2.7.17 to add Transas ORS-3 type sensor. Enter the parameters specified below:

When ORS-3 type sensor is added, the screen displays “General” dialogue box, where the following parameters should be entered:

- in “Radar ID” spin box – identification number of the radar (VTS chart object), corresponding to the connected radar;
- in “Radar Name” text field – name of the sensor;
- in “ORS Configuration” set the radio button corresponding to the configuration in use – Single or Dual;
- radar processor parameters of the main Radar processor computer – in “Radar processing (main)” section:
  - IP Address of the computer where ORS-3 software is installed – in “IP Address” text field;
  - number of IP port in compliance with the settings in `Varp31.ini` file on the ORS-3 computer ([General] section, BasePortNum = XXXX. Default value is 6000)– in “IP Port” spin box.

- parameters of radar control of the main Radar processor computer – in “Radar Control (main)” section:
  - IP Address of the computer, which is connected to the radar – in “IP Address” text field;
  - number of IP port in compliance with the settings in `ORSServ.ini` file on the ORS-3 computer ([Network] section, parameter BasePort = XXXX. Default value is 3000) – in “IP Port” spin box.
- in case of Dual configuration enter Radar processor backup computer corresponding parameters in “Radar Control (backup)”:
  - when the configuration is changed to Single and is then returned to Dual, the previously entered parameters of the backup ORS computer are not saved, and are replaced with default values.

3.9 CONNECTION OF ORS3 TO THE RADAR

3.9.1 List of Compatible Radars

In Slave Mode (without Control)

Radars of the following type can be connected to Navi-Harbour 1000/2000/3000 and Navi-Traffic systems in the mode without control:

- Litton BridgeMaster II;
- Scanter Terma;
- Scanter Terma 2001;
- BridgeMaster E (requires BMECU);
- Furuno8xx1;
- Sperry Rascar;
- Atlas 8600;
- KelvinHughes Nucleus2 5000S;
- KelvinHughes Nucleus2 5000X.

In Master Mode (with Control)

Radars of the following type can be connected to Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS system for the operation in Master mode:

- Litton BridgeMaster II (requires BMCU);
- BridgeMaster E (requires BMECU);
- Ryad 326620P/326660P, Ryad 106660P (for the Russian market only);
- Scanter Terma;
- Scanter Terma 2001.

3.9.2 Connecting Radar Analog Signals

The following analog radar signals should be connected to ORS3 radar processor: Video, Trigger (Synchro), Azimuth, Heading Mark.

For the connection of these signals, in case of most radars, use ORS3 Interface Unit (ORS3 IU) included in the ORS3 delivery set. Procedures for the connection and adjustment of signal parameters for the use in ORS3 IU, are detailed in **ORS3 INTERFACE UNIT. INSTALLATION MANUAL**.

With ORS3 radar processor connected to BridgeMasterE radar both, in Master and in Slave modes, BridgeMasterE Control Unit (BMECU) should be used. Procedures for the connection and adjustment of signal parameters for the use BMECU, are detailed in **BM-E CONTROL UNIT INSTALLATION MANUAL**. With the use of BMECU, ORS3 IU device is not required.

3.9.3 Connection of Control Channels for Master Mode

Depending on the type of the radar control serial interface, connect the appropriate serial port of ORS3 computer to the radar control port.

3.9.4 Additional Signals for Slave Mode

If the radar has discrete signals (Log.0/Log.1), coding transmission status, current pulse length, active transceiver number, to enable automatic selection of the radar processing parameters (virtual ORS3 radars) in Slave mode, these signals should be connected to the discrete ORS3 IU inputs. Connection procedure is detailed in **ORS3 INTERFACE UNIT. INSTALLATION MANUAL**. Procedure for the adjustment of the automatic processing parameter switching is detailed in sec. 3.7.1.

3.10 FIRST RUN

After all the aforementioned procedures for the initial adjustment of ORS3 radar processor and ODU 0 have been completed, it is necessary to run the system aor the first time and check that all the hardware and software components are operational. To do this:

3.10.1 Running the Programs

Turn on the computers with ODU 0 and ORS3 radar processor. Wait until the operating systems have been loaded and software components have been run automatically on both computers. Then ascertain that:

1. The following programs have been run on ORS3 computer:
   - ORS Server program;
   - VARP31 program.
2. The following programs have been run on ODU 0 computer:
   - Navi-Harbour ODU 0 program;
   - VARP Integrator 2 program.

3.10.2 Switching the System to “Function” Mode

After the loading of all the software components, switch the system to “Function” mode. To do this, select SUPERVISOR\FUNCTION menu item on ODU 0. Check also that the radar processor is in “Run” mode. To do this, open “Radar processor” tab on the radar control panel and ascertain that “Run” mode has been selected for the ORS. Then check that:

1. In “ODU 0 – Transas Navi-Harbour” window:
   - there is a network connection with ORS3 radar processor (“no connection alarm” is absent);
   - there is network connection with Transas Target Manager (“no connection alarm” is absent).

Note: At this stage, there may be a faulty radar processor alarm in connection with absence of input radar signals. This alarm should disappear as the radar is switched to transmission.

2. In “VARP Integrator2” window:
   - a line with ORS3 sensor name has appeared on the “Sensor list”;
   - as this line is selected, the space to the right of this disk shows the availability of ORS3 connection on the target and time channels – “OK” value in “Targets ch:” and “Time ch:” lines;
3. In “ORS Server” window:
   - there are no “Driver err 0”, “DSP XXX err 0” type alarms in the status bars in the bottom part of the window.
4. In “VARP31” window:
   - there are no diagnostic messages about the impossibility to open the device;
   - there is threshold adjustment segment chart in the window.

3.10.3 Switching Target Tracking off

To avoid ORS3 radar processor overload at the stage of the first run and before the end of adjustment, construction of masks and optimising of adjustment, turn off tracking in VARP31 window. To do this, press “Autotracking” (“Tracking”) button.

3.10.4 Turning the Radar on

Switch the radar to transmission by using the radar control panel on ODU 0 (for MASTER mode) or the standard radar display (for SLAVE mode).

3.10.5 System Operation Check

After the radar has been switched to transmission, check that:

- radar picture has appeared in VARP31 window
- turn on the radar picture in the chart window on ODU 0 (CHART\OVERLAYS\RADAR…). Check that the picture has appeared in the chart window.

3.11 RADAR PICTURE ADJUSTMENT

ATTENTION!

Perform adjustment operations for each pulse length of every radar.

Position the centre of the ODU navigation window in the reference point *. Keep varying “Headup” and “Delay” value until the centre of the reference point radar picture is coincident with its chart position.

Press “save settings” toolbar button to save the found “Headup” and “Delay” values.

In the main Varp31 program window:

- press “Access” button and enter the password;
- switch “Autotrack” toolbar button to “Off”.

On ODU:

- turn on the display of the radar picture from the radar which is being adjusted, in the chart window;
- position the centre of the chart window in the coordinates of a conspicuous feature (reference point);
- select the display scale so that the radar picture of the conspicuous feature is within the chart window.
- keep varying “Headup” value in the main Varp31 window until the landmark bearings are coincident with its radar picture;
- keep varying “Delay” value in the main Varp31 window until the landmark centre is coincident with its radar picture;
- press “save settings” toolbar buttons to save the found “Headup” and “Delay” values;
- check the calibration accuracy by another reference point. If the coordinates of the radar picture centre do not match the chart position of this reference point, see sec.3.17(9);

- if necessary, exclude the reference point from the tracking prohibited zone and turn on autotracking on VARP31 toolbar. In 3-4 minutes compare the coordinate of the reference point tracking symbol with its actual coordinates (see Note). If the symbol's deviation exceeds 20% of the pulse length or half the antenna beamwidth, keep varying "Headup" and "Delay" values until you obtain the best possible coincidence of the tracking symbol with the PPI centre.

Note: It is first worthwhile to determine the actual coordinates of the reference point by using a high accuracy positioning system, e.g, DGPS.

3.12 INPUT OF BLANKING SECTORS

To reduce the load on the ORS3 computer and to reduce the information flow from ORS3 to ODU, it is advisable to set blanking sectors.

Blanking sectors are intended for:

1. Excluding sectors which are of no interest for the radar observation, from the radar processing (for all the modes of ORS3 use).
2. Turning off the radar transmission in the sectors which are of no interest for the radar observation (for MASTER mode in case of operation with the BMCU and BridgeMaster II radar).

ATTENTION!

Setting of blanking sectors in the operation with any radar types except in Master mode for BridgeMaster II, does not result in the turning off of the radar transmission in these sectors. To turn the transmission off, set blanking sectors on the radar display or in the radar control unit.

To set the blanking sectors, use the procedure for editing the radar processing parameters detailed in sec. 3.7.2 and enter the blanking sector start and end values (in degrees) for each set of parameters.

3.13 CREATION OF SENSOR INDIVIDUAL CHART

Associated with each ORS-3 sensor is its individual chart, which includes four object classes:

- no tracking areas;
- tracks saving areas;
- video masking areas;
- target routes.

These objects are accessible for editing when the sensor chart editing mode is enabled (select SUPERVISOR\ENABLE SENSOR CHARTS EDITING menu item). To create the ORS-3 sensor chart objects use the standard procedure of creating a new object, select the type of the object to be created from the “New Object’s Chart & Class” dialogue box.

Note: ORS-3 sensor areas of the same type should not intersect each other.

3.13.1 No Tracking Area

Use video mask and no tracking area editing option in ODU. Corresponding to each radar pulse length is a no tracking area. The following guidelines should be use din the construction of no tracking areas:

- no tracking area may contain embedded polygons, but each polygon should be closed;
- external space of the outer polygon is a tracking area;
- tracking area should be minimised proceeding from the system’s actual responsibility zone;
- unjustified increase of the number of polygon vertexes should not be permitted;
- in the narrows, it is advisable to set the no tracking area boundary as far from the fairway as possible, but so that the area includes weak echoes from the objects protruding above the water surface (rocks, etc.). To do this:
  - position the PPI centre in the surveyed segment;
  - select “Segment” option, turn off “CFAR” and after setting “Sensitivity” value as equal to the set automatic threshold minimum (see sec.3.15.2), find the boundary of weak echoes from the coast;
  - restore the initial segment settings.

On the chart, these area boundaries are shown with blue thin strokes.

3.13.2 Video Masking Areas

Video masking areas allow a considerable reduction in the amount of data from ORS3, which reduces load on the ORS computer, communication channel, ODU computers and logging system.

As the video mask is set, it is necessary to reduce, as much as possible, the amount of data corresponding to the shore echoes, being guided by the following principles:

- video mask may contain embedded polygons, but each polygon should be closed;
- video is not masked beyond the external polygon;
- unjustified increase of the polygon vertexes should not be permitted.

On the chart, these area boundaries are shown with green thin strokes.

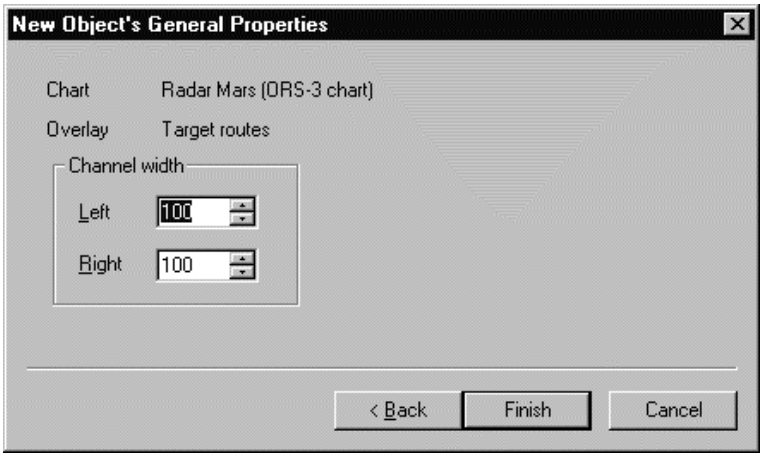
3.13.3 Tracks Saving Area

When an ORS-3 tracked target enters the Tracks saving area, its further tracking is performed on the assumption that within this area the target retains its speed and direction. In this case the radar signal from this area is ignored. Examples of places where track saving areas should be created are areas with a large amount of clutter, areas invisible to the radar due to the obstacles (rocks), any areas where there are problems with the source data for tracking.

On the chart, these areas are shown with blue fine dotted lines.

3.13.4 Target Routes

Target routes should be created inside Tracks saving areas. When creating a new Target routes line enter the channel width parameters.



For a target tracked by ORS-3 sensor, whose entry to the Tracks saving area is within the channel zone, it is considered that this target will proceed moving with the same speed according to the given route. Under this assumption the place and time of this target exit from the Tracks saving area are calculated to proceed tracking of this target by ORS-3 sensor.

On the chart, Target routes are shown with thin red strokes.

3.13.5 Adjustment of Waiting Time before the Arrival of Video Data

With the connection established with the source of video and targets (ORSServ program) the system is awaiting the arrival of new data for the set time. If the aforementioned data has not arrived during this time, “Failure” system message is provided, whilst the radar picture in the Chart Window disappears. The waiting time is set in seconds by FrameTimeout variable in [Mode] section of `NharbN.ini` file on each ODU N. The default value is FrameTimeout=30.

3.13.6 ORS-3 Target Acquisition Criterion

For the manual acquisition of targets from the ORS-3 the following criterion is used: that target is selected, which the <Distance from the target to the marker, m> + Coeff*status – size value turns out to be the least for, where the marker is a mouse click point on the chart (when “Acquire target” tool is selected), status and size values are supplied from the radar processor, whilst the numeric Coeff coefficient is set via ETSAcqCoeff variable in [Mode] section of `NHarb0.ini` file. It is advisable to use ETSAcqCoeff variable default value of 20.

3.14 OPTIMISING ORS-3 SETTINGS

Optimising initialisation file settings are required for ensuring the balance of Gain, Sea and Rain settings, development of adequate weighted assessment of these parameters in the mode of automatic control of the specialised detected video filter sensitivity and effectiveness (SLR, SSR). Settings described in this section should be made for every virtual ORS-3 radar.

3.14.1 Noise Level and Min Sensitivity Parameter Measurements

- Run Varp31 and the radar;
- Press “access” button and enter the password;
- Check that SSC and SIR filters are active;
- Position the window centre on the outer ring of the segment where no echoes from the coats or local objects were observed;
- Select Segment option in the monitor detection area;
- Set NAF=8;
- Switch “CFAR” button to “Off”;
- Keep reducing the “Sensitivity” control value gradually until the density of echoes in the selected segment corresponds to the required one at Gain=100 (normally 3…6 own noise marks). Enter this “Sensitivity” value in the installation log as S1;
- Switch “CFAR” button to OFF. Keep varying “Sensitivity” value until the initial density of false alarms is obtained. Enter this “Sensitivity” value in the installation log as S2;
- S2 value determines Min Sensitivity value, whereas S1-S2 produces the Noise Level;
- Select RADARS\EDIT menu item for the operating virtual radar and enter the measured Min Sensitivity and Noise Level parameter values in the relevant fields of “Radar Parameters” dialogue box.

3.14.2 Anti-rain Shift Measurements

This parameter is a scalable multiplier or the amplitude characteristics of the through receiver – interface unit – RPB attenuator channel. It is not meaningful unless there is logarithmic receiver and is equal to the number of RPB ADC quants corresponding to the change of signal at 12 dB at the radar receiver input. If the receiver's dynamic range (D_r) is known, whereas the maximum signal corresponds to Q_{max} of ADC quants:

$$\text{Anti-Rain Shift} = 12\, Q_{max}/D_r$$

If the receiver's dynamic range is not known, the ORS-3 technological tools can measure it, or set Anti-Rain Shift directly.

The simplest way to make Anti-Rain Shift measurements is if the receiver's own noises are not cut off. This is indicated by the hash width at the end of the sweep which makes up not less than 20% of the maximum signal amplitude.

In this case:

- Run Varp31 and radar;
- Press "access" button and enter the password;
- Position the window centre on the external ring in the segment where echoes from shore and local features were observed;
- Select Segment option in detection area;
- Turn off SSC and SIR filters;
- Set NAF=8;
- Check that CFAR is turned on and keep reducing "Sensitivity" value until the noise density is obtained in the selected segment which is admissible in the rain area at Gain=100 (normally 3…6 own noise marks). Enter this "Sensitivity" value in the installation log as Anti-Rain Shift;
- Turn on SSC and SIR filters;
- Select RADARS\EDIT menu item for the operating radar and enter the measured Anti-Rain Shift value in the relevant field of Radar Parameters dialogue box.

If the receiver's own noises are cut off to a considerable extent, the Anti-Rain Shift measurement method described above is not applicable. In this case, you can use measurements of amplitude of an echo from the trial target or any other ship moving in a radial direction relative to the radar. The amplitude difference (in ADC quants) corresponding to the double change of the target range, with its aspect remaining unchanged, is equal approximately to Anti-Rain Shift.

3.14.3 Reference Gain Measurement

- Run Varp31 and the radar.
- Press "Access" button and enter the password.
- Select "Dispensed" option in detection group. Set Rain=70. Use "Gain" control to set the video intensity which is required at Gain=0.
- Select RADARS\EDIT menu item for the operating virtual radar and enter the obtained Gain value in Reference Gain field of Radar Parameters dialogue box.
- Press "OK" button in "Radar Parameters" and "Radars" dialogue boxes. Check that Gain, Sea, Rain controls ensure the required video adjustment range.

3.14.4 SLR Adjustment

- Run `Varp31.exe` and the radar;
- Press “Access” button and enter the password;
- Select All option in detection group;
- Turn off SLR filter;
- Watch the effects generated by the antenna pattern side lobes manifesting themselves as solid and dashed arcs passing through the target mark. If these effects are not observed, the SLR adjustment may not be performed;
- Position the PPI centre on the target with the antenna patter side lobe manifestation, and turn on the built in oscillograph;
- Set the following options:

  X-axis =(bearing, degrees, 1);

  Y-axis =(samplings over threshold, ADC quantum, 20).
- Fix the oscillogram by pressing Pause button. The oscillogram corresponding to the side lobe manifestation, should clearly show the known general behaviour of the antenna pattern consisting of the dominating main and descending side lobes.
- Construct the curve of side lobe maxima;
- Draw a slanting line passing over the side lobe maxima to the left of the main lobe. Assuming y_0 is the ordinate of this line intersection with the axis of the main lobe whose azimuth is f0, fm is azimuth of this line intersection with x axis, a0 is the main lobe amplitude, then

$$\mathrm{FirstSidelobeRelativeLevel} = \mathrm{a}_0 - f_0$$

$$\mathrm{SidelobeDescend} = \frac{360\mathrm{PRFDiv}}{\mathrm{PRF}} \frac{y_0}{|f_m - f_0|}$$

- Repeat this procedure for the side lobes to the right of the main lobe;
- Repeat this procedure for several other targets with the side lobe manifestation;
- Fide mean values of FirstSidelobeRelativeLevel and SidelobeDescend, decrease them by 20% and enter them as the relevant initialisation file parameters;
- Turn on SLR.

Interference in the form of arcs passing through the target mark is sometimes caused by the dispersion of the antenna radiation on the local features or by the deterioration of focusing. Unlike in the case of effects caused by the antenna side lobes, the oscillogram does not show the characteristic lobe structure, but there is a noticeable pedestal. It is the difference between the echo signal maximum and pedestal height which determines AntennaScatteringLevel initialisation file parameter.

If the interfering objects are at a certain distance from the antenna, the interference range may exceed the target range by more than 30 m. In this case, AntennaScatteringLevel2 initialisation file parameter is also equated with the difference between the echo signal maximum and pedestal height.

SLR filter can be turned off in part of segments. Normally this becomes necessary when the local objects cause a significant distortion of the antenna radiation pattern at certain azimuths and angles of the position.

3.14.5 ACF Adjustment

- Run `Varp31.exe` and the radar;
- Press “access” button and enter the password;
- Turn off SSR filter;
- Watch the effects caused by the multiple echoes of the outgoing pulse which manifest themselves in the form of duplicates of the actual target mark, whose azimuth is coincident with the azimuth of the real target, and which are located at a range larger than that of the actual target. If these effects are not observed in connection with multiple echoes from the local objects, watch the multiple echo as the ships are proceeding on parallel courses;
- Position the window centre on the target with manifestation of multiple outgoing pulse echo and turn on the built in oscillograph;
- Set the options:

  X-axis =(range, SE clocks, 50);

  Y-axis =(samplings over threshold, ADC quantum, 20).
- Fix the oscillogram by pressing Pause button. The oscillogram corresponding to the manifestations of multiple echoes represents a descending succession of video signal surges. Construct a curve of these surge maxima.
- Draw a slanting line on the curve majorising the video signal surge maxima. ACF value is equal to this line’s inclination coefficient taken with the opposite sign.
- Repeat the measurements for other targets in other locations. Enter the least of the measured ACF values in the initialisation file.

3.15 ADJUSTMENT OF THE AUTOMATIC SENSITIVITY CONTROL SYSTEM

The automatic sensitivity control system serves for maintaining the optimum target detection sensitivity with the limited density of false detections (d_e). Along with measurements of the actual d_e values, delimiters for the threshold reduction are formed by the minimum sensitivity level determined by the current Rain setting and minimum threshold value set locally at the stage of the automatic sensitivity control adjustment. The latter prevents the occurrence of clutter at calm sea which is inadequately taken into account in d_e calculations (e.g, fixed or unstable clutter).

d_e measurements are used for the threshold adjustment in segments only which are open to tracking in more than 20% of their area. In other cases, the steadied threshold value in the closest open segment is used directly, rather than the feedback mechanism. This threshold adjustment method can be assigned manually in any segment (linking, linked threshold); in this case the segment which serves as the threshold setter can be specified directly. This option is useful in case of individual clutter whose amplitude is larger that that of targets in this segment.

Along with the control of sensitivity by the set d_e, ORS-3 has a capability to perform adjustment in accordance with the radar potential variations. With the unstable radar potential, this is equivalent to the operation with a fixed threshold. This option is useful in case of irregular clutter with a limited amplitude. It should be noted that the maximum amplitude of this clutter in proportionate to the radar potential and, accordingly, to the mean amplitude of a certain reference point.

3.15.1 Setting of False Detection Density

The density of false detection is a factor which determines the false track formation probability. As a rule, even with the moderate sea, it is practically impossible to achieve the close-to-zero false detection density without noticeable deterioration of the target observability. On the other hand, a small number of initiative false tracks has practically no effect on the system front-end characteristics except, possibly, the error probability in the processing of complex target collision avoidance manoeuvres, but the further growth of the false detection density tells negatively on the overall tracking stability. Optimising of this parameter is, therefore, a compromise between the target observability and tracking stability. The base distribution of the false detection density, optimised for type conditions, is determined in the initialisation file and is used by the automatic sensitivity control if not set otherwise by the system user.

Correction of the base distribution in the small circle segment is made if with moderately adverse weather conditions, the false track formation period does not exceed four minutes. For other segments, the critical false track formation period is equal to one minute.

It is allowed to correct the base density by increasing it in an individual segment if with moderately adverse weather conditions, targets essential important from the viewpoint of navigation cannot be observed in a stable manner. In this case, the false track formation period in the segment should not be less than half of the value mentioned above.

To correct density in a segment:

- press “access” button and enter the password;
- check that SSC and SIR filters are active;
- position window centre in the segment subject to corrections;
- select Segment option in Detection group of ORS3 monitor;
- check that “on” option has been selected for this segment in mode menu in auto-threshold area;
- set <Req.> equal to the required density of false detection expressed as a total amount within the segment in 32 scans periods.

Note: As the base density of false detection is determined, its space and time correlation is essential, as even single correlated false detections form false tracks with a high degree of probability. The share of correlated false detection normally increases with the sea growing rougher due to the echoes from the crests of relatively stable waves and depends, to a great extent, on their fetch.

3.15.2 Setting of the Minimum Threshold in a Segment

The setting of an appropriate minimum threshold ensures:

- protection from the excessive threshold reduction resulting in the detector instability with the radar’s own noise dominating;
- reduction of false detection density relative to the limit value at moderate sea;
- reduction of interference inadequately taken into account in the calculations of false detection density (e.g, fixed or unstable clutter).

Implementation of these functions generally requires increase of the minimum threshold from the top to the bottom:

1. Adjustment of Protection from the Excessive Threshold Reduction:
   - press “Access” button and enter the password;
   - position the window centre on the external ring;
   - select All option in option in Detection group of ORS 3 monitor;
   - set the controller at {min thr} S1+1 (see sec. 3.14.1).
2. Reduction of False Detection Density Relative to the Set One[4].

   Adjustment of the minimum threshold for reducing the false detection density should be preceded by the studying the signal level of a minimum (trial) target) at different ranges from the radar.

[4] – reduction of false detection density relative to the set value, is achieved at moderate sea only

To measure the current values of the trial target signal level, use the built in ORS-3 oscillograph:

– position the centre of the window on the trial target and call the built-in oscillograph window;

– set the options:

X-axis =(range, NM, 0.5);
Y-axis =(samplings over threshold, ADC quantum, 20).

– evaluate the mean value of the target signal and enter this value and target range in the table (X-axis);

– repeat measurements may time for different ranges and aspects of the trial target;

– plot the results on the graph in amplitude/range coordinates;

– find the bottom limit of amplitude/range distribution.

To ensure the decrease of the false detection density relative to the set value, with the observability of minimum targets retained, the minimum threshold should be set in accordance with the bottom limit of the trial target amplitude distribution. To do this:

– press “access” button and enter the password;

– position the centre of the window successively in each ring.

Assuming the centre of the window is positioned in I ring, then:

– use the marker to measure the range of the external boundary of ring i and find on the graph its corresponding bottom limit of the trial target amplitude distribution [$a_{min}(i)$];

– select Ring option in Detection group of ORS-3 monitor;

– select On option on Mode menu in Auto-threshold group;

– set the controller {min thr} equal to $a_{min}(i)$, but not less than S1+1 (see sec. 3.14.1).

3. Reduction of Clutter.

Should some fixed or unstable (sporadic) clutter be observed is some zones of the unmasked area with the calm sea in automatic sensitivity control mode, it can be suppressed by increasing the minimum threshold in the appropriate segments. If this clutter appears after the completing of the procedure detailed in sec 3.15.2(1), it should be noted that the further increase of the minimum threshold will result in the local deterioration of observability of targets with smaller radar cross section. The setting of the reducing threshold in the segment is made in the following way:

– press “Access” button and enter the password;

– position the centre of the window in the segment where the interference which should be suppressed are observed;

– select Segment option in detection group of ORS-3 monitor;

– set Off option in MODE menu in Auto-threshold area;

– switch off CFAR in Detection area;

– keep increasing Sensitivity parameter until undesirable interference disappears from the segment;

– set the same value in the controller {min thr} in Auto-threshold are and restore On option in MODE menu;

– turn on CFAR in Detection area.

WARNING!

If the obtained Sensitivity value ensuring undesirable clutter in the segment exceeds significantly the average amplitude value of a trial target at an appropriate range, setting of the reducing threshold will result in the loss of targets with smaller radar cross section.

3.15.3 Setting of Linked Threshold

- Press “Access” button and enter the password;
- Position the centre of the window in the segment which the linked threshold should be specified for;
- Select Segment option in detection area of ORS-3 monitor;
- Set Link option in MODE menu in Auto-threshold area.

This determines the use of external threshold for this segment. By default, the source of the external threshold is the closest open segment in the spiral search procedure, but it can be specified directly in the following way:

- position the marker in the segment which should the source of the linked threshold and click the right mouse button;
- in the menu which will open up, select “set as threshold source”.

3.15.4 Setting of Related Threshold

To implement the related threshold function, it is necessary that a reference point (checkpoint 1) should be determined in the appropriate radar section in `varp31.ini` initialisation file. At the same time, this reference point may be intended for the measurement of the radar potential variation, this is why an additional condition of implementing the related threshold functions is the permission to use the reference point (UseCheckpoint=Y) in AutoThresholding section of the initialisation file:

- press “Access” button and enter the password;
- position the centre of the window in the segment which the related threshold should be specified for;
- select Segment option in detection area of ORS-3 monitor;
- set Related option in MODE menu in Auto-threshold area.

This determines the use of an external threshold for this segment.

3.16 SEGMENT GROUPING

ORS-3 has a capability to form the groups of segments with limited control. The specific feature of such groups is their being independent of the external control in Gain and Sea parameters. In addition, any settings made by using ORS-3 monitor extend to the selected group only. Owing to the group's independence of the external control in Gain and Sea parameters, it is worthwhile to use them in the areas with irregular distribution of clutter. These are normally closed segments loaded with local objects with large radar cross section and small fragments of water area which do not contain segments free of echoes from local objects. Here the moving average of video signal is connected, in an indefinite manner, with distribution of clutter, and CFAR mode should be turned off. In this connection, Gain and Sea settings made from the remaining part of ORS operating area with the use of CFAR mode, prove to be inadequate in such fragments.

All the groups of segments with limited control are functionally identical, except the base (default) group which, by default, covers the entire ORS operating range, and which is the only one which external Gain and Sea control is applied to. Nothing else is initially regulated for the group of segments with limited control, and should be determined by the service engineer (system administrator). Specifically, in the closed parts of the water area with irregular clutter distribution, as long as they are not determined as a group of segments with limited control, it is advisable to turn off CFAR, automatic sensitivity adjustment and set the Sensitivity value ensuring clutter suppression in the worst possible conditions. In this case, it is necessary to be oriented to the trial target amplitude distribution (see sec.3.15.2(2)), maximum amplitude of irregular clutter (see sec.3.15.2 (3)) and amplitude of rain and sea clutter in the worst possible weather conditions. Within the closed area, the last member is normally not dominating, otherwise it may be advisable not to turn off the automatic sensitivity adjustment but set rather a high minimum threshold value (see sec. 3.15.2 (3)). The disadvantage of the latter is the possible loss of monitoring of target detection in the given group of segments in case of overall disabling of the automatic sensitivity adjustment, which, however, is not crucial, the mode of overall disabling of automatic sensitivity adjustment mode is auxiliary.

The recommendations set forth above do not exhaust possible options of using groups with limited control. The user can him/herself build up the necessary combination of settings in a group, adequate to the local clutter situation and tasks to be fulfilled.

To add a segment to a group, including a new group:

- press “Access” button and enter the password;
- position PPI centre in the required segment and click the right mouse button;
- in the menu which will open up, select “Move block to” option if there is no direct offer to add the segment to the required group; if there is, select the this groups and the adding of the segment will be completed;
- in the window which will open up, select the required group from the list or press “New” button and assign a name to the newly formed group.

To exclude a segment from the group, add it to default group.

3.17 TROUBLESHOOTING

N	Manifestation of a fault	Possible cause	Ways to eliminate
1	Error code is not equal to 0 in the test mode	Code 2h: Operation 3.4.1 has not been performed. Operation 3.4.2(3) has not been performed. RPB board is out of order	Perform operation 3.4.1. Perform operation in sec. 3.4.2(3). Replace the RPB
2	No dashed rings in the test mode	RPB is out of order	Replace the RPB
3	Non-uniform structure of rings in the test mode	RPB is out of order	Replace the RPB
4	Error code is not equal to 15 with the test and radar off	Interference in the line of signals from the radar	Improve the PC and radar earthing circuits. Transform the error code to binary. Use the error code table to identify the source of interference
5	Error code is not equal to 0 with the radar ON	Signal polarity incorrectly set in the ini file	Use the oscillograph to determine the radar signal polarity. Change the `VARP31.INI` settings to match the signal parameters
		Error in the performance of operation 4 of sec.3.4.2	Use the oscillograph to determine the radar signal type. Perform operation 4 of sec.3.4.2 to suit the radar signal type
		Radar connection cable is out of order	Replace the cable
6	Image refresh rate on the PPI does not correspond to the radar antenna	Number of ACP pulses set incorrectly in the radar parameters	Bring Radar/Parameters submenu settings into accord with the actual number of ACP pulses
7	PRF value displayed on ORS-3 monitor differ significantly from those specified for the operating radar mode	Error in operation detailed in 3.7.2 in RPB adjustment procedure	Use the oscillograph to determine the type of the radar trigger signal. Perform the operation detailed in sec. 3.7.2in RPB adjustment procedure as appropriate to the radar trigger signal type
		Duplicated trigger signal as a result of unmatched impedance of the long-distance transmission circuit	
8	Failure to obtain adequate radar picture on the local ORS 3 monitor PPI by using Gain and Sea settings (error code is 0)	Faulty radar	Check if the radar operating status is in accordance with the user documentation
		Video polarity set incorrectly in the radar parameters	Use the oscillograph to determine video polarity at the RPB input. Video polarity is considered to be positive a larger power of the received signal corresponds to the larger video value
		Attenuation of RPB attenuator set incorrectly	Use the oscillograph to assess the video amplitude at the RPB input. Set the attenuator according to the assessed maximum
9	Discrepancy between the measured positions of secondary reference points and their actual coordinates	Radar coordinates set incorrectly	Specify the radar coordinates

3.18 VARP31 DIAGNOSTIC MESSAGE CODES

VARP31 program contains functions of diagnostics of the software, RPB3 and arrival of external signals.

In case of failure to configure RPB3, as ORS3 is started, a fatal error message is sent to VARP31 display and to the ODU, and the program is aborted. With the successful RPB3 configuring, the subsequent system diagnostics are performed permanently, and the results are shown in the relevant field of the status bar and are sent to the users every 4 seconds, or when a connection is established, or when the error code changes. Errors are coded with the units of the following status word bits:

Message	Error bit	Error code
OK		0
No starts	0	1
No azimuths	1	2
No markers	2	4
No video	3	8
Buffer overfilled	4	16
RPB failure	5	32
Non-fatal radar processing error		>100

3.19 RADAR STATUS DIAGNOSTICS PANEL

The diagnostics panel enables the continuous monitoring of the radar processors status in “Function” mode. To open this panel:

- select WINDOW\DIAGNOSTICS PANEL\RADARS menu item if it is unchecked or
- select WINDOW\STATUS:RADARS. If there is no such item, press MORE WINDOWS and select STATUS:RADARS in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Displayed data	Status
Name	Sensor name	
Connection	Availability of network connection[5]	Green – connection is available Red – connection is not available Transparent – in Standby mode
ORS	ORS alarms	Green – no alarms Yellow – there is a warning Red – there is an alarm Transparent – no data
Radar	Radar alarms (in Master mode only)	Green – no alarms Red – there is an alarm Transparent – no data
Video	Monitoring of availability of video on the ODU	Green – video is updated Red – video is not updated Transparent – in Standby mode
Fixed points	ORS-3 alarms on radar reference points (Fixed points)	Green – no alarms Red – there is an alarm Transparent – no data

A red lamp in RP column is used for showing the following diagnostic messages:

- any ORS-3 error;
- warning ORS-3 RW_VIDEO during 6 sec. or
- warning ORS-3 RW_TRIGGER during 6 sec. or
- warning ORS-3 RW_BEARING or
- warning ORS-3 RW_HEADING.

A red lamp in RP column is used for showing the following diagnostic messages:

- warning ORS-3 RW_VIDEO up to 6 sec. or
- warning ORS-3 RW_TRIGGER up to 6 sec. or
- warning ORS-3 DSP_PERF, HOST_PERF.

[5] – a check is made for the availability of the VTS server connection with the given ORS on all the channels, connection of the ODU with the ORS on all the channels (if any) and the ODU connection with the VTS server on the channels used for the radar data transmission (if any). In case of disconnection on any of the aforementioned channels, a red lamp lights up and “No Network Connection” alarm is generated. It should be noted that Video channel is not taken into account unless the radar picture is turned ON at the ODU.

A red lamp in Video column lights up in the following instances:

- no new video data has arrived during the time set by FrameTimeout variable in `NharbN.ini` file, or
- warning ORS-3 RW_VIDEO during 6 sec, or
- any ORS-3 error, or
- radar is in Standby mode, or
- radar Processor is in Standby mode.

3.20 REMOTE START OF RP COMPUTER

Should you encounter problems with the radar processor software, you can re-start the RP computer from ODU or Service Monitor program: open “Radars” dialogue box (SENSOR\RADARS menu item) on “Radar processor” tab and press “Hardware” button of “ Restart” group:

- if the RP computer has Watchdog card, and the driver is configured according to the recommendations of sec.3.5.2, there is a hardware re-start of the RP computer, equivalent to a press on Reset button;
- if Watchdog driver is not configured, whereas the OS operates adequately on the RP computer (i.e, there is no computer hang-up), there is a computer re-start equivalent to that performed by “Restart” command.

CHAPTER 4

ORS-2 Radar Processor

This chapter contains necessary information for handling ORS2 Radar Processor.

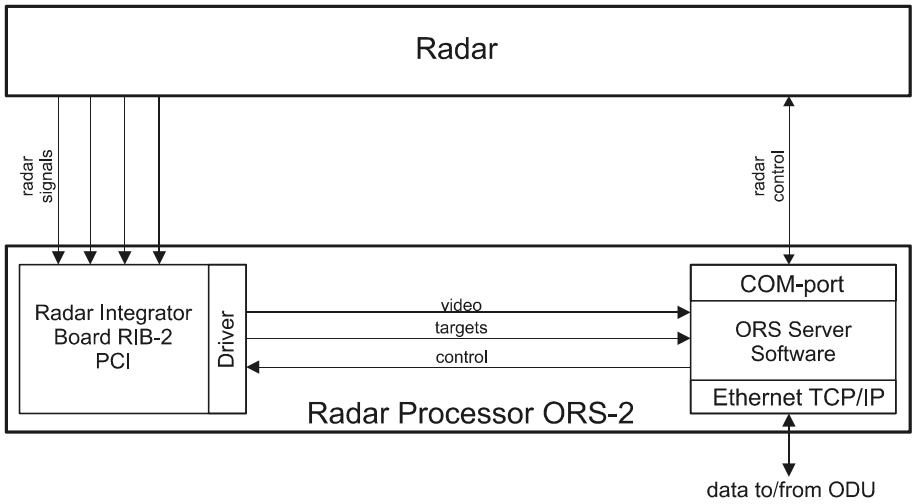
Copyright Transas Marine Ltd., 2003

4.1 GENERAL

ORS2 radar processor is a powerful PC compatible computer under the control of Windows 2000 operating system, with dedicated RIB2 radar processing boards and dedicated software by TRANSAS installed into it.

4.2 GENERALISED ORS2 RP STRUCTURE

The drawing below shows the generalised structure of Transas ORS2 radar processor.



According to this structure, the following dedicated hardware and software components should be installed on ORS2 computer:

1. RIB2 PCI card.
2. RIB2 PCI card driver. The driver is installed at the time of installation of Transas Radar Processor Libraries.
3. ORS Server software.

4.3 COMPUTER AND OS REQUIREMENTS

4.3.1 ORS2 Computer

For the radar processor, prepare a computer meeting the requirements set forth in this paragraph, install Microsoft Windows 2000 (English or Russian version) SP 2 on it, along with dedicated ORS software.

For the radar processor to operate normally, the ORS computer should meet the requirements specified in the table below:

Characteristic	Minimum requirement	Recommended
Processor	PIII/600 MHz	PIII/800 MHz
RAM	128Mb	256 Mb
Video adapter	4Mb AGP or PCI	8Mb AGP or PCI
Hard disk	4Gb	
CD drive	Required	
Free slots	1xPCI or 1xISA	
Network adapter	Ethernet/Fast Ethernet	
Operating system	Windows 2000 SP2 English/US version	
Maintenance monitor	15'', 1024x768/75Hz	
Keyboard, mouse	Standard	
RS-485 interface	Necessary if BridgeMaster II radar is required to be capable of being controlled	
Watchdog	Type: Advantech or WDT-01. Necessary if the processor is required to be installed at an unmanned site	
Free hardware resources	One of IRQ 3-7, 9-15	

A serial RS-485 interface is required for the interaction of the ORS radar processor with the BridgeMaster II radar control device. Normally, this kind of interface is organised via an additional RS-485 interface card.

The Watchdog enables the ORS radar processor to restore itself automatically in case of all kinds of failures. This capability enhances the radar processor's fault tolerance. It is essential when the ORS is installed at an unmanned site, and the manual restart is rather problematic.

4.3.2 Operating System Installation

Materials Required

Installation license Microsoft Windows 2000 Service Pack 2 CD.

Radar processor software operates under Microsoft Windows 2000, English/US version, Service Pack 2. Installation of the operating system should be made by a qualified specialist holding an appropriate Microsoft certificate. Follow an appropriate installation instruction provided by Microsoft Corporation. The following components should be installed:

- Network drivers for all network adapters installed in this computer;
- TCP/IP protocol.

For TCP/IP or “Workgroup”/”Domain” settings consult your network administrator.

Special Case of Two Computers

If only two computers are connected to your network (ODU and ORS), a simplified procedure for setting IP addresses described in sec.2.4.1 can be used.

Note: Upgrade the operating system with Service Pack 5 if some earlier edition of Service Pack is installed or is not installed at all.

Check of Network Software Adjustment

To check the correctness of IP address setting and to find out the IP address when it is received from the DHCP server, use the following procedure:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ipconfig” and press <Enter>.
3. List of IP addresses for every network adapter will be shown.

Check of TCP/IP Connection

It is necessary to check that TCP/IP connection between radar processor computer and ODU 0 has been established. To check TCP/IP connection between two computers use the following procedure for the both computers:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND Prompt to run MS DOS Prompt.
2. Type “ping IP_ADDRESS” where IP_ADDRESS is the IP address of another computer, and press <Enter>.
3. Check that other computer responds to the requests. In this case the screen should display “Reply from IP_ADDRESS:” messages.

Creating Radar Processor User

To enable the automatic Radar Processor (RP) logon, it is necessary to create RP user by following the procedure detailed below:

1. Login to operating system Windows as Administrator.

ATTENTION!

If START\PROGRAMS\ADMINISTRATIVE TOOLS menu item is not displayed, click the right mouse button on the task panel, select PROPERTIES from the context menu. In “Taskbar and Start Menu Properties” dialogue box, switch to ”Advanced” tab where you should check “Display Administrative Tools” check box.

2. Select START\PROGRAMS\ADMINISTRATIVE TOOLS\COMPUTER MANAGEMENT menu item: the screen will display “Computer Management” dialogue box:
   - in the tree on the left, select LOCAL USERS AND GROUPS\USERS item;
   - open the context menu and select NEW USER item: the screen will display “New User” dialogue box;
   - enter the User name and Full name in the appropriate text boxes (for example: Username="ORS");
   - enter the password and confirm it (for example: Password="ors");
   - uncheck “User must change password at next logon” check box;
   - check “Password Never Expires” check box;
   - press ”Create” command button of “New User” dialogue box;

– select LOCAL USERS AND GROUPS\GROUPS item;

– double click the mouse on “Administrators” group in the list of groups: the screen will display “Administrators Properties” dialogue box;

– press “Add” command button: the screen will display “Select Users or Groups” dialogue box;

– select the newly created user in the list and press “Add” command button;

– press “OK” command button of “Select Users or Groups” dialogue box to add a newly created user to the group of administrators.

3. Login to operating system Windows 2000 as ORS user.

4.4 INSTALLATION OF ORS2 HARDWARE

Installation of ORS2 hardware required no preliminary settings.

Turn off ORS computer power supply and disconnect the cable from the computer. Carefully insert RIB2 board in vacant PCI slot and fix it.

4.5 INSTALLATION OF ORS2 SOFTWARE

4.5.1 List of ORS2 Software Modules

The following software modules should be installed on ORS2 radar processor computer:

1. ORS server program;
2. Transas Radar Processor Libraries containing RIB-2 PCI card driver.

4.5.2 ORS Server Program Installation

Materials Required

Navi-Harbour license distributive CD.

Installation Procedure

Run `SETUP.EXE` program from *\ORS* folder of distributive CD:

- when prompted to Choose Destination Location confirm the suggested path or enter the path of your own by pressing “Browse…” command button;
- when prompted to Select Program Folder confirm the suggested name or enter a different name;
- in “Autologon” dialogue box check “Enable Autologon” check box to avoid the password input during the loading Windows and enter the ORS user password in “Password” text box;

- use “Watchdog Type” dialogue box to select Watchdog type used in the ORS computer:
  - select “WDT-01” if the system board of the given type is in use and see documentation on the board to provide correct address in “Base address” spin box;
  - select “Advantech” if the system board of the given type is in use and enter in “Advantech Watchdog Properties” dialogue box the following parameters of Watchdog driver:

    “Set watchdog” Port – 0x443;
    “Clear watchdog” Port – 0x443.

ORSSERV Program Re-installation

ATTENTION!

Whenever a computer with the Radar Processor software installation is subjected to any operations connected with changes in the network equipment configuration and/or TCP/IP protocol features, the Radar Processor software is required to be re-installed.

If ORS software is required to be re-installed without any loss of information about current hardware configuration, use the following procedure:

1. Uninstall ORS Server program:
   - make a mouse double click on “Add/Remove Programs” icon on the Control Panel;
   - select “ORS 3.7” line from the list of programs and press "Add/Remove…" command button.

Note: If for any reason the line “ORS 3.7” is not on the list of programs in the Control panel use a simplified procedure for the ORS software deinstallation. This procedure consists in removing ORSServer shortcut from the “Startup” folder and deleting from the disk of the folder where ORS software is installed.

2. Since after automatically removal the folder where ORS software was installed may contain some files (namely, `*.dat` files and `NHRdMon.cfg` folder), remove them from the disk manually.
3. Re-install ORSSERV program using the procedure described in sec. 4.5.2 of this Manual.
4. Restore the ORS configuration from the Configuration backup file (see sec.2.13.1 of this Manual).
5. Re-start Windows 2000.

Note: When run for the first time, ORSSERV program starts operating in “Run” mode, selection of the Control Set is made automatically.

4.5.3 RIB2 Driver Installation

The Radar Integrated Board is installed by using “Radar Integrated Libraries” software package.

To install the package start the computer and run `Setup.exe` program out of the supplied “Transas Radar Libraries Setup” (*\RIB_2\DISK\SETUP.EXE*) installation package, then follow the installation program’s instructions.

The installation package enables the necessary files to be copied, RIB2 driver to be installed and registered. Upon the end of installation, the program will offer to run the processing parameters adjustment utility. Reject this option. Adjustment of processing parameters is performed by modifying `vts_int.cfg` file and will be detailed below.

ATTENTION!

After completing the installation and before the beginning of work, the computer is required to be re-started.

4.6 ORS2 SOFTWARE COMPONENT SETUP

4.6.1 ORS Server Program Setup

To set up ORS Server program, use `ORSServ.ini` and `Signals.cfg` configuration files.

Use `ORSServ.ini` file to make the following settings:

1. Select the type of the radar processing board in use.
2. Adjust network parameters as required.
3. Adjust radar control parameters (if the radar control is used).
4. `Signals.cfg` file is intended for adjusting automatic switching of the radar processing parameters in the operation with an radar without control (Slave mode). In case of operation in Master mode, settings made in this file do not affect the ORS operation.

Selection of the Radar Processing Board Type

Set ORSDriver = ORSDRVX parameter in [ORS] section for the operation with RIB2.

Adjustment of Network Parameters

In most cases, no change of network parameter default values is required, therefore, the procedure detailed in this section is not performed unless, for some reasons, the use of IP port 3000 is undesirable.

To change network settings, enter the base IP port value in [Network] section.

BasePort = – base port.

If the port value has been changed, do not forget to specify this value at the time when you create ORS2 type sensor on ODU 0.

Operating System Automatic Reboot

In case some fatal errors occur in the program, there is a facility for rebooting automatically the operating system of the computer where the radar processor is operating. This facility is adjusted in `ORSServ.ini` configuration file by using the following procedure:

Create [Mode] section where RebootOnError=1 or RebootOnError=on string should be added.

The aforementioned capability is ignored in the debug mode (when [Debug] section specifies that DebugMode=1).

Note: To reboot the operating system adjusted as described above, Windows user should have an authority to reboot the system.

With Watchdog functionality available, there is not need to adjust these parameters, as if such errors occur, there is a hardware reset of the radar processor computer.

Adjustment of Radar Control Parameters

Radar control parameters are adjusted in [RadarControl] section of `ORSServ.ini` file.

If the radar processor is not used for the radar control (Slave mode, make the following settings:

- RadarType = None;
- ManualControl=0 if you use an automatic change of processing parameters in accordance with `Signals.cfg` settings (see below) or
- ManualControl=1 if It is necessary to change processing parameters manually (not recommended).

If the radar processor control the radar, you should:

- RadarType = – select the type of radar to be controlled from the list provided in `ORSServ.ini` file;
- ManualControl= – it is advisable to set 0;
- In the section with the name of the selected radar, set the necessary parameters. Description of each of the parameters is provided in comments to the relevant `ORSServ.ini` line.

Adjustment of Signals.cfg File (for Slave Mode Only)

Automatic switch of the radar processing parameters is only possible if the radar provides binary data signals on the current pulse length and radar transmission status, and these signals are connected to the radar processor discrete ports In1 – In4. If this information is not available, parameters can be switched depending on PRF value. This capability can naturally be used if the radar has different PRF value at every pulse length.

`Signals.cfg` file contains a table which can be used for selecting, depending on the status of In1 – In4 radar processor ports, the number of the radar, pulse length number, as well as the radar transmission status.

Before editing, read carefully the comments contained in the file.

To adjust the switching parameters, analyse code combinations supplied by the radar, and enter the appropriate values in the table.

To use switching by PRF value for the relevant code combinations, delete P values (e.g, the line may have Code0000=R1T2 form). In this case, the pulse length number for this code combination will be determined by the current PRF hitting PRF1, PRF2, PRF3, PRF4 range defined at the end of `Signals.cfg` file.

Note: As PRF range is set, it is advisable to determine mean values for each pulse length from the appropriate field of “Statistics" tab of ORS Server window, rather than from the radar certificate. After PRF mean values have been determined, se the range to both sides of the mean value with a sufficient margin for PRF instability.

If the pulse length is determined, there is switching to the set of parameters with number ((radar number-1)*4+(pulse length number-1)).

To prevent false switching, the automatic switch of a parameter set may occur with a delay: Delay variable of [Signals] section sets the number of successive identical readings required for the switching of a parameter set (by default, this value is equal to 2).

Example: the system uses 2 radars with binary signal with information on the currently active data connected to input In1. The pulse length is determined by PRF. The radar has three pulse lengths Short: PRF=3600, Medium: PRF-1800, Long: PRF=900. `Signals.cfg` settings:

Code0000=R1T2
Code1000=R2T2

PRF1=2800-4000

PRF2=1400-2700

PRF3=500-1300

PRF4=000-400 – not used.

4.6.2 Configuring of Radar Processing

For the adjustment of radar parameters connected to ORS2, edit `VTS_INT.CFG` file. `VTS_INT.CFG` is stored in the subdirectory of IRadar folder where the ORS Server is installed.

Editing of `VTS_INT.CFG` file is allowed during ORSServ program operation. After editing is done one should either re-start ORSServ program or perform the “Reset” command from the Control panel of appropriate radar on Navi-Harbour ODU.

Correct [Radar_0] and [Radar_1] sections (if two radars are used) to suit the radar parameters:

Radar parameters

Type = "BridgeMaster"	radar type;
Rotations per minute =	antenna rate of revolutions (revolutions per minute);
Number of bearings =	number of bearings per antenna revolution;
IFA type =	IAF type: 0 – logarithmic, 1 – linear;
Beam width=	Antenna beam width in degrees;

Signal polarity

Polarity= //video: positive-0, negative-1;

trig_polarity = //trigger: positive-0, negative-1;

hdg_polarity= //heading: positive-0, negative-1.

4.7 ADJUSTMENT ODU FOR OPERATION WITH ORS2

Before starting to configure the ODU for the operation with the radar processor check that the following has been done:

- Navi-Harbour software and electronic charts have been installed on ODU 0;
- during the initial ODU 0 run (as per sec.2.8.1) the VTS configuration has been set.

To set up an ODU for the operation with the radar processor, use the following procedure:

1. Create “Radar” VTS chart object (for the details of chart editing see ODU User Manual).
2. Create Transas ORS-2 Type Sensor as described in sec.4.7.1.
3. Edit the individual sensor chart (see sec.4.12 of this Manual).
4. Adjust the tracking quality (see sec.4.13.1).
5. Adjust the waiting time before the arrival of video data (see sec.4.15).

4.7.1 Creating Transas ORS-2 Type Sensor

Edit sensor configuration on ODU 0, as described in sec.2.8.7 to add Transas ORS- 2 sensor. Enter the parameters specified below.

When Transas ORS-2 type sensor is added, the screen displays “General” dialogue box, which requires entering of the following parameters:

- in “Radar ID” spin box – identification number of the radar (VTS chart object), corresponding to the connected radar;
- in “Radar Name” text field – name of the sensor;
- in “IP Address” text field – IP address of the ORS computer;
- in “IP Socket” spin box – IP port number of the ORS computer;
- in “Data output” drop-down list box select the number of ORS data channels in use.

Enter the following parameters in “Extractor” dialogue box:

- distance and azimuth target extraction parameters respectively;
- antenna beamwidth value in “Aperture” spin box.

Use “Tracking – General“ dialogue box to set the value of “Query mode duration” which controls the number of target marks after which the target stops to be a query target. It is advisable to set the value of 20.

Use “Tracking – Weights” dialogue box to set the following parameters:

- “New target” – check time characteristic for each new target before its image appears in the chart window; the increase of this parameter corresponds to the check duration;
- “False alarm” – the increase of this value reduces the probability of appearance of false marks; it is advisable to set 10;
- “Target skip” – the increase of this value reduces the probability of target mark omission and, therefore, cancelling of targets;
- “Manual acquisition” – the increase of this value reduces the duration of checks of targets acquired manually, and results in the fast appearance of the target in the Chart Window; it is advisable to set 15.

Use “Tracking – Hypotheses” dialogue box to set the parameters controlling the search for the best possible correspondence between a set of track and set of marks:

- “Maximum competing“ – maximum number of combinations saved for the subsequent analysis (including the winning hypothesis; it is advisable to set 5;
- “Quality limit” – limit of difference between the likelihood of the winning and saved hypotheses (hypotheses whose difference in likelihood exceeds this value, are not saved);
- “Background life limit” – existence time of a saved hypothesis (in revolutions) which was not corroborated.

In “Tracking – Conflicts” dialogue box, change values of the following parameters:

- “Maximum targets” – set 3;
- “Maximum plots” – set 10.

4.8 ORS2 CONNECTION TO THE RADAR

4.8.1 List of Compatible Radars

In Slave Mode (without Control)

Radars of the following type can be connected to Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS in the Slave mode:

- Litton BridgeMaster II;
- Scanter Terma;
- Scanter Terma 2001;
- BridgeMaster E (requires BMECU);
- Furuno8xx1;
- Sperry Rascar;
- Atlas 8600;
- KelvinHughes Nucleus2 5000S;
- KelvinHughes Nucleus2 5000X.

In Master Mode (with Control)

Radars of the following type can be connected to Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS for the operation in Master mode:

- Litton BridgeMaster II (requires BMCU);
- BridgeMaster E (requires BMECU);
- Ryad 326620P/326660P, Ryad 106660P (for the Russian market only);
- Scanter Terma;
- Scanter Terma 2001.

4.8.2 Connection of Radar Analog Signals

The following analog radar signals should be connected to ORS2 radar processor: Video, Trigger (Synchro), Azimuth, Heading Mark.

Connect Azimuth and North Mark signals to the LF-box. No tuning of these signals is required.

Connect Video and Trigger (Synchro) signals to the HF-box and tune "Video" and "Trigger" signal level by using appropriate potentiometers in the HF-box, being guided by the light diode fluorescence.

Light diode fluorescence indicates one of the three states:

- flashing with a frequency of 1 Hz – "Trigger" signal level is too low;
- flashing with a frequency of about 5 Hz – "Trigger" signal is normal, overload on "Video";
- lighted permanently – "Trigger" and "Video" are normal.

Proceeding from this, it is first necessary to obtain steady reception of "Trigger" signal, and then set the maximum level of "Video" signal which does not cause overloading.

With the connection of ORS2 radar processor to BridgeMasterE radar both, in Master and in Slave mode, BridgeMasterE Control Unit (BMECU) is required to be used. Procedures for the connection and adjustment of signal parameters with the use of BMECU device, are detailed in **BM-E CONTROL UNIT. INSTALLATION MANUAL**. With the use of BMECU device, neither HF box or LF box is required.

4.8.3 Connection of Control Channel for Master Mode

Depending on the type of the serial radar control interface, connect the appropriate serial port of ORS2 computer to the radar control port.

4.8.4 Additional Signals for Slave Mode

If the radar has discrete signals (Log.0/Log.1) encoding the transmission state, current pulse length, active transceiver number, to ensure the automatic selection of the radar processing parameters in Slave mode, you should connect these signals to the discrete inputs of LF box. Procedure for the adjustment of the automatic processing parameters switch, is detailed in sec. 4.6.1.

4.9 FIRST RUN

After performing all the procedures described above for the initial adjustment of ORS2 radar processor and ODU 0, it is necessary to turn the system on for the first time and check that all the hardware and software components are operating. To do this:

4.9.1 Running the Programs

Turn on the ODU 0 and ORS2 radar processor computers. Wait until the end of the OS loading and automatic run of software components on both computers. After this, check that:

- ORS Server program is running on ORS2 computer;
- Navi-Harbour ODU 0 program is running on ODU 0 computer.

4.9.2 Switching the System to “Function” Mode

After the loading of all the software components, switch the system to “Operation” mode. To do this, select SUPERVISOR\FUNCTION menu item on ODU 0. Check also that the radar processor is on “Run” mode. To do this, open “Radar Processor” tab on the radar control panel and check that “Run” mode has been selected for the ORS. Then ascertain that:

1. In “ODU 0 – Transas Navi-Harbour” window:
   – there is a network connection with ORS2 radar processor (no absence-of-connection alarm).

Note: At this stage, there may be a faulty radar processor alarm in connection with absence of input radar signals. This alarm should disappear as the radar is switched to transmission.

2. In “ORS Server” window:
   – There are no “Driver err 0”, “DSP XXX err 0” type alarms in the status bars in the bottom part of the window.

4.9.3 Turning the Radar on

Switch the radar to transmission by using the radar control panel on ODU 0 (for MASTER mode) or the standard radar display (for SLAVE mode).

4.9.4 System Operation Check

After the radar has been switched to transmission, turn on the radar picture display in the chart window on ODU 0 (CHART\LAYERS\RADAR...). Check that the picture has appeared in the chart window.

4.10 RADAR PICTURE ADJUSTMENT

Adjustment is made for each radar independently (where two radars are used) by the radar conspicuous features whose polar coordinates are known with an accuracy not inferior to 0.1° in azimuth and 2 m in range.

Azimuth adjustment (BearingOffset) is an offset for an angular deflection between the radar North Mark and the actual direction to the north. The offset value is determined as a difference between the bearing value of radar distinctly conspicuous and uniquely identified radar object measured on the chart or in other way, and the mean value of several bearing readings for the same object taken from the RI. The offset corresponds to the value of an angle counted clockwise, which the image should be turned to bring it in coincidence with the actual situation. The offset is entered with an accuracy of up to one tenth of a degree.

Range adjustment (DistanceOffset) is a compensation for Trigger signal delay in the radar and RI channels. Offset value is determined by comparing results of range measurements for fixed uniquely identified radar objects obtained from the RI radar picture and measurements on the chart or made in another way. Offset is entered with an accuracy of up to 1 m.

After making the appropriate measurements, enter the adjustment results in the following lines of `VTS_INT.CFG` file:

1. BearingOffset= Azimuth offset in degrees
2. DistanceOffset= Range offset in metres

4.11 INPUT OF BLANKING SECTORS

To reduce the load on the ORS2 computer and to reduce the information flow from ORS2 to ODU, it is advisable to set blanking sectors.

Blanking sectors are set in `VTS_INT.CFG` file and are intended for:

1. Excluding sectors which are of no interest for the radar observation, from the radar processing (for all the modes of ORS2 use).
2. Turning off the radar transmission in the sectors which are of no interest for the radar observation (for MASTER mode in case of operation with the BMCU and BridgeMaster II radar).

ATTENTION!

Setting of blanking sectors in the operation with any radar types except in MASTER mode for BridgeMaster II, does not result in the turning off of the radar transmission in these sectors. To turn the transmission off, set blanking sectors on the radar display or in the radar control unit.

To set the blanking sectors, correct [General] section:

Determine blanking sectors by modifying Blank_Sectors= parameter. The first digit stands for the number of blanking sectors (from 0 to 4), then pair after pair, the beginning and end of each sector.

It is allowed to form up to four non-intersecting blanking sectors ordered by angle from 0 to 360. A sector passing over 0 is split into two sectors: before and after 0.

To turn off blanking, set zero value in the number of sectors.

Example: two blanking sectors from 23 to 142 degrees and from 246 to 315 degrees are determined:

Blank_Sectors = 2 23 142 246 315 0 0 0 0.

4.12 TRANSAS ORS-2 INDIVIDUAL CHART

Associated with each ORS-2 type sensor is its individual chart, which includes two object classes:

- Radar zones;
- Video masking zones.

These objects are accessible for editing when the sensor chart editing mode is enabled (select SUPERVISOR\ENABLE SENSOR CHARTS EDITING menu item). To create the ORS-2 sensor chart objects use the standard procedure of creating a new object, select the type of the object to be created from the “New Object’s Chart & Class” dialogue box.

Note: ORS-2 sensor areas of the same type should not intersect each other.

4.12.1 Radar Zones

Radar zones allow primary target extraction to be prohibited. Such zones should be set in the places which are zones of a stable echo from objects other than targets (i.e, objects which do not require to be tracked), e.g, in the coastal area or in the surf zone.

For Transas ORS-2 sensor radar zone, the following characteristics can be set:

- name of the zone (in “Name” field);
- “No extraction” checkbox to cancel the primary target extraction in this zone;
- “Number of skips before drop” to determine how many times the signal from the target should be omitted, for the target to be cancelled.

4.12.2 Video Masking Zones

Video Masking Zones are designed for the masking of the raw radar picture processing and display. These zones can be set over each area of the water surface or shore. The setting of such zones allows the loads on the Radar Processor and communication channels to be considerably reduced. Pressing the “Masking” button on “Settings” tab of “Radars” dialogue box (SENSOR\RADARS menu item) turns on the masking of the radar video.

For any videomasking zone of Transas ORS-2 sensors the following characteristics can be set:

- name of the zone (in “Name” text field);
- masking on/off (“Masking” check box).

4.13 CONFIGURING OF RADAR PROCESSING PARAMETERS

Parameters of video signal processing and primary target extraction in ORS2 radar processor are configured by modifying `VTS_INT.CFG` file.

4.13.1 Input of Scanning Area Parameters

Enter the parameters for scanning areas in [RANGE_X] sections.

The type version may contain the following parameters:

- MPSet_Name- name of the scanning area (may contain quantisation frequency and the scanning area delay in mcs);
- Sample_Rate – quantisation frequency in KHz;
- The quantisation frequency should be selected depending on the pulse length:
  - with the pulse length of less than 0.15 mcsc (short) it is 40000 KHz (in this case the observation area range will be 4 miles at 2000 quants); 20000 KHz (8 miles) is allowed for use;
  - with the pulse length of 0.15 mcs to 0.6mcs (medium) its is 20000 KHz (8 miles), 40000 KHz (4 miles) and 10000 KHz (16 miles) are allowed for use;
  - with the pulse length of more than 0.6 mcs (long) it is 10000 KHz (16 miles), 40000 KHz (4 miles), 20000 KHz (8 miles) and 5000 KHz (32 miles) are allows for use.

Delay is the area delay (in conventional units from 0 to 1000, 1 unit = 100ns):

Sector_Length – number of quants in the observation area range (from 0 to 2040). This number should not exceed Sector_Length and DSP_Sector_Length values set in PRIMARY sections.

Pulse_Length – code of the outgoing pulse length (used for the automatic s–election of areas with the change of the outgoing pulse length) For any pulse length code only one viewing area can be selected. Below is correspondence of codes and lengths:

- Pulse_Length = 0 – short;
- Pulse_Length = 1 – medium;
- Pulse_Length = 2 – long.

LR – in accordance with Table 4-1.

Table 4-1

Fquant, MHz / Parameter	40	20	10	5	2.5
LR	30	30	30	20	10

loThreshold
hiThreshold
Threshold
} in accordance with Table 3

med_up
med_down
disp_up
disp_down
} in accordance with Table 2

Selection of med up, med down, disp up, disp down parameters depending on the observation area delay value and quantisation frequency.

Table 4-2

Delay 1un.=100ns / Fquant, MHz	<300	300-600	>600
	Number of column in Table 4 which the parameter values are selected from		
40	1	1	1
20	2	1	1
10	3	2	1
5	4	3	2
2.5	5	4	3

Selection of loThreshold, hiThreshold, Threshold parameters depending on the observation area delay value and quantisation frequency.

Table 4-3

Delay 1un.=100ns / Fquant, MHz	<300	300-600	>600
	Number of column in Table 4 which the parameter values are selected from		
40	1	2	3
20	2	3	4
10	3	4	5
5	4	5	5
2.5	5	5	5

Selection of adjustment parameters:

Table 4-4

№ / Parameter	1	2	3	4	5
Med up	5	6	8	10	14
Med down	10	12	18	24	40
Disp up	2	2	3	3	4
Disp down	2	2	3	3	4
LoThreshold	12	8	7	6	5
HiThreshold	18	12	10.5	9	7.5
Threshold	78	48	41	33	26

4.13.2 Selection of the Primary Processing Parameters

The adjustment of different scanned areas may require the correction of the detection thresholds. In actual practice, the number of spots should be 2 or 3 times the number of ships and other objects classified as targets in the scanned area.

The threshold is determined from the following correlation:

$$T = E + K * \sigma + up,$$

Where

E is the mean noise value in the calculated point;

K is a coefficient for the noise mean quadratic deviation;

Up is a constant threshold level for all the points.

The upper and lower thresholds only differ in the coefficient for the mean quadratic deviation which is determined by Threshold parameter.

Two adjustment options are offered: by using Radar Tuning Dialog utility and without using it, corrections being made direct in `VTS_INT.CFG` configuration file. The former is preferable.

In some individual cases, adjustment by using the configuration file is permitted.

Note: Changes in the configuration file require utmost care, as errors which may be entered, may disrupt the program's operation!

Use of Radar Tuning Dialog

- Run ORSServ and NaviHarbour;
- Switch to Parameter tab in Radar Tuning Dialog window;
- Set Thr_Disable=0 (NO);
- Change the position of Threshold sliding bar, checking the adjustment result by the number of spots in the Navi-Harbour;
- Repeat the previous step as required;
- Save the changed parameters by pressing "Set as startup" button.

  (as this is done, LoThreshold, HiThreshold and Threshold values will be simultaneously changed in `VTS_INT.CFG` file).

Correction of VTS_INT.CFG File

- Run ORSServ and NaviHarbour;
- Open `VTS_INT.CFG`;
- Set Thr_Disable and Threshold parameters in their respective area field;
- Set Thr_Disable=0;
- Set a value out of 0 to 100 range for Threshold parameter;
- Save the changes;
- Close ORSServ and re-start ORSServ;
- Check the adjustment results by changes in the number of spots in the Navi-Harbour;
- Repeat the preceding four steps as required.

4.13.3 Automatic Adjustment of Thresholds by Spots

It is recommended that for the automatic adjustment separate scanned areas should be created.

Use of Radar Tuning Dialog

- Run ORSServ and NaviHarbour;
- Switch to Parameter tab in Radar tuning dialog window;
- Set Thr_Disable=0 (NO);
- Change the position of Threshold sliding bar, checking the adjustment result by the number of spots in the Navi-Harbour;
- Set Thr_Auto_X = – 1;
- Set the number of spots supported by the automatic adjustment to Thr_Spot_Number parameter;
- Set Thr_Auto_Disabl = 0 (NO);
- Save the changed parameters by pressing “Apply” button;
- In the area selection field re-select the area which the Navi-Harbour is handling;
- Check the adjustment results by the change in the number of spots in the Navi-Harbour;
- Save the changed parameters by pressing “Set as Startup” button.

Correction of VTS_INT.CFG file

- Run ORSServ and Navi-Harbour;
- Open `VTS_INT.CFG` file;
- Set Thr_Disable, Threshold, Thr_Auto_Disabl, Thr_Spot_Number, Thr_Auto_X parameters in their respective area field;
- Set Thr_Disable=0;
- For Threshold parameter set a value from the range of 0 …100;
- Set Thr_Auto_X = -1;
- Set the number of spots supported by the automatic adjustment to Thr_Spot_Number parameter;
- Set Thr_Auto_Disabl = 0;
- Save the changes;
- Close ORSServ and run ORSServ again;
- Check the adjustment results by the change in the number of spots in the Navi-Harbour.

If necessary, additional adjustment of thresholds can be performed by changing Up parameter which is called “up” in `VTS_INT.CFG`, and thr_Const in Radar tuning dialog.

4.14 TRACKING QUALITY ADJUSTMENT

Special parameters of [Mode] section in `Nharb0.ini` file described below affect the quality of target tracking when the Transas ORS-2 sensor is used. Open `Nharb0.ini` file and edit the values of the aforementioned parameters by using the description and recommendations provided in this paragraph:

- VeloLim – maximum target tracking rate (in m/s). It is necessary to set the maximum value for the speed of targets which should be tracked by the system. Targets with lower speed are not acquired;
- AcqRadDenom – acquisition radius parameters. Value 3 (recommended for the Transas ORS-2) correspond to the target acquisition in the internal circle of “Acquire Target” tool. Remove the comment from this parameter (i.e, remove “;”).

4.15 ADJUSTMENT OF WAITING TIME BEFORE THE ARRIVAL OF VIDEO DATA

With the connection established with the source of video and targets (ORSServ program) the system is awaiting the arrival of new data for the set time. If the aforementioned data has not arrived during this time, “Failure” system message is provided, whilst the radar picture in the Chart Window disappears. The waiting time is set in seconds by FrameTimeout variable in [Mode] section of `NharbN.ini` file on each ODU N. The default value is FrameTimeout=30.

4.16 RADAR STATUS DIAGNOSTICS PANEL

The diagnostics panel enables the continuous monitoring of the radars processors status in “Function” mode. To open this panel:

- select WINDOW\DIAGNOSTICS PANEL\RADARS menu item if it is unchecked or
- select WINDOW\STATUS:RADARS. If there is no such item, press MORE WINDOWS and select STATUS:RADARS in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Displayed data	Status
Name	Sensor name	
Connection	Availability of network connection[6]	Green – connection is available Red – connection is not available Transparent – in Standby mode
ORS	ORS alarms	Green – no alarms Yellow – there is a warning Red – there is an alarm Transparent – no data
Radar	Radar alarms (in Master mode only)	Green – no alarms Red – there is an alarm Transparent – no data
Video	Monitoring of availability of video data on the ODU	Green – video is updated Red – video is not updated Transparent – in Standby mode

A red lamp in RP column is used for showing the following diagnostic messages:

- any ORS-2 error;
- warning ORS-2 RW_VIDEO during 6 sec. or
- warning ORS-2 RW_TRIGGER during 6 sec. or
- warning ORS-2 RW_BEARING or
- warning ORS-2 RW_HEADING.

A yellow lamp in RP column is used for showing the following diagnostic messages:

- warning ORS-2 RW_VIDEO up to 6 sec. or
- warning ORS-2 RW_TRIGGER up to 6 sec. or
- warning ORS-2 DSP_PERF, HOST_PERF.

[6] – a check is made for the availability of the VTS server connection with the given ORS on all the channels, connection of the ODU with the ORS on all the channels (if any) and the ODU connection with the VTS server on the channels used for the radar data transmission (if any). In case of disconnection on any of the aforementioned channels, a red lamp lights up and “No Network Connection” alarm is generated. It should be noted that Video channel is not taken into account unless the radar picture is turned ON at the ODU.

A red lamp in Video column lights up in the following instances:

- no new video data has arrived during the time set by FrameTimeout variable in `NharbN.ini` file, or
- warning ORS-2 RW_VIDEO during 6 sec. or
- any ORS-2 error, or
- radar is in Standby mode, or
- radar Processor is in Standby mode.

4.17 REMOTE RESTART OF RP COMPUTER

Should you encounter problems with the radar processor software, you can re-start the RP computer from ODU or Service Monitor program: open “Radars” dialogue box (SENSOR\RADARS menu item) on “Radar processor” tab and press “Hardware” button of “Restart” group:

- if the RP computer has Watchdog card, and the driver is configured according to the recommendations of sec.4.5.2, there is a hardware re-start of the RP computer, equivalent to a press on Reset button;
- if Watchdog driver is not configured, whereas the OS operates adequately on the RP computer (i.e, there is no computer hang-up), there is a computer re-start equivalent to that performed by “Restart” command.

CHAPTER 5

UAIS Transponder

This chapter contains useful information for handling UAIS Transponder.

Copyright Transas Marine Ltd., 2003

5.1 CONNECTION AND ADJUSTMENT OF OPERATION WITH AIS TRANSPONDERS

If the system uses AIS transponders in its operation, check that Transas Target Manager is installed on ODU 0 computer (see sec.3.8.1.)

5.1.1 List of Compatible Base AIS Transponders

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems enable fully functional operation with Transas UAIS T200/T210 and и MDS MIII base station transponders.

5.1.2 Equipment Requirements

UAIS transponders are connected via a standard serial data transmission interface to ODU 0 or any VTS system computer which has a free serial interface port.

5.1.3 Preparation for the Installation

Transponders used as sensors of Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems, should be installed, adjusted and tested in accordance with their associated documentation.

5.1.4 Connection of UAIS Transponders

The base transponder interface port is connected to the serial port of the selected VTS system computer where the AIS Server program is installed.

5.1.5 Installation of AIS Server Program

AIS Server program (UAIS Server) in installed with ODU software package only.

Install ODU software on AIS Server computer. When the program asks for a license, specify the path to any ODU license. To be run, AIS server program required no dongle.

After ODU software installation, restart the computer and open the folder where this software was installed.

Find `UAISSERV.EXE` file and create a shortcut to this file on the desktop. Copy this shortcut to “Startup” folder for UAIS Server program to be run automatically at the computer start.

5.1.6 Adjustment of Sychronising with UTC Time

For the correct functioning of the subsystem for the processing of information on the motion of UAIS tracked targets, as well as for the correct integration of radar and UAIS targets, it is necessary to ensure AIS server synchronising with UTC time.

This kind of synchronising can be provided in one of the following ways:

1. By receiving of appropriate synchronising messages containing UTC time from AIS base station, with an interval not inferior to that recommended in ITU-R M.1371.
2. By synchronising the clock of the computer where the AIS Server software implemented, with an external UTC time source (e.g, satellite time server).

Depending on the selected synchronising source, set the appropriate parameter if the synchronising time source in AIS Server `UAISServ.ini` setup file:

- SyncTimeSource=Msg4 (default value) – the source of UTC time is Message 4 ITU-R M.1371;
- SyncTimeSource=Msg1 – the source of UTC time is Message 1 ITU-R M.1371. This message cannot be used unless, for some reasons, the transponder does not supply Message 4;
- SyncTimeSource=Local – this value cannot be selected unless the clock of the computer where the AIS Server is run, is synchronised with an external UTC time source.

ATTENTION!

Setting of SyncTimeSource=Local parameters without synchronising of the computer clock with UTC time is not permitted, as this may result in considerable errors in the display of coordinates of tracked targets.

5.1.7 Setup of AIS Server Program

After the installation of AIS Server program, it is necessary to set its parameters in accordance with the type and parameters of the transponder connection to the AIS Base Station. To do this, open `UAISServ.ini` file and edit values of the following parameters:

[Config]

UAISName – connected base station type: Transas;

ConfigType – configuration in use: Single or Dual;

IsControlEnabled – base station control: 1 or 0, 1 by default (ON);

PrimPort – serial port number for communication with the main operation set;

PrimParam – port parameters for communication with the main operation set (<rate (bits/s)>,<parity>,<data bits>, <stop bits>):

For Transas T200/T210: 9600,N,8,1;

ResPort – serial port number for communication with the backup operation set;

ResParam – port parameter for communication with the backup operation set (<rate (bits/s)>,<parity>,<data bits>, <stop bits>), e.g., 9600,N,8,1;

For Transas T200/T210: 9600,N,8,1.

[Mode]

SilentExit – setting for the display of an inquiry at the program closing time: 1 – no inquiry is displayed; 0 (default value) – the inquiry is displayed.

[Telegram]

Timeout – time in minutes allocated to the sending of a telegram and reception of acknowledgement from the base station, 15 minutes by default.

IsMainActive, IsMainPowerOn and IsMainPowerOn parameters from [Config] section are used in case of a backed up configuration for the saving and further reconstruction during the program start, of the parameters like the active operation set (IsMainActive), power supply status of the main operation set (IsMainPowerOn) and power supply status of the backup operation set (IsBackPowerOn).

5.1.8 Adjustment of ODU 0 for Operation with UAIS Transponders

If the Navi-Harbour system uses AIS transponders, it is necessary to create a Universal AIS class sensor (VHF Transponders sensor family).

Creating Universal AIS Type Sensor

Edit sensor configuration on ODU 0 to add Universal AIS class sensor (see. sec.2.8.7 of this Manual). Enter the parameters specified below.

Universal AIS Sensor Parameters

When a Universal AIS sensor is added, the screen displays “General” dialogue box, which the following parameters should be entered in:

- use the radio buttons of “Assign Allias” to select the algorithm of AIS targets alias setting used in this VTS System;
- to add a transponder press “Add” button: the screen displays “General” dialogue box:
  - in “Name” text field enter the base station name;
  - in “AIS Base Station Id” spin box enter the base station ID number;
  - check/uncheck “Enable device control” to enable/disable base station control from this VTS System;
  - in “Network Address” dialogue box enter IP address and IP port number of the computer where the AIS server program is run.

AIS Sensor Individual Chart

Where the sensor configuration is supplemented with Universal AIS class sensor, its individual chart is generated. The objects of this chart are AIS base station zones. For each zone, responsible base stations are selected. The first (correctly operating) base station on the list of responsible base stations is used for sending/receiving telegrams to/from the targets within this zone. With the main base station made inoperative, its functions are transferred to the next base station from the list of responsible base stations, etc.

If none of the responsible base stations operate, targets from this zone are not acquired. Targets beyond the zones of all the available base stations are not acquired either.

As a new base station is added, it is automatically placed on the list of responsible base stations for all the available zones (at the end of the list). As a base station is removed, its name is deleted from the list of responsible base stations for all the zones. If a certain station name is changed, this name is added to the end of responsible base station list for all the available zones.

Generation of a New Zone

To create a new zone, first create this zone's boundaries and then define its. (For the details of zone generation see sec. **Special Operations on the Zones** in the user manual):

- enable the mode of sensor chart editing (select SUPERVISOR\ENABLE SENSOR CHART EDITING menu item);
- open "New Object's Chart and Class" dialogue box (press "Chart Editor" button or select EDIT\NEW OBJECT menu item*)*;
- click twice on "UAIS Network (UAIS Network chart)" line and select "Transponder zone borders";
- create a closed line on the chart clicking the left mouse button at break points or using "Create Arc/Circle" tool (depending on the shape of the zone border);
- select the created zone and set its features:
  - press the toolbar button and select in the drop-down menu UAIS NETWORK – TRANSPONDER ZONES or select CURSOR\PICK ZONE\UAIS NETWORK – TRANSPONDER ZONES menu item;
  - click the left mouse button in any point inside the zone;
  - enter the parameters provided for this zone in "Properties" dialogue box.

AIS Transponder Zone Features

The properties of a zone are its name and a list of responsible base stations:

- enter the zone name in "Name" field;
- on "Responsible AIS Base Stations" tab, set the list of responsible base stations;
- select the base station name from "Available" list and press "<<" button or double click the left mouse button on the base station name;
- to remove a base station from the list of responsible base stations, select its name and press ">>" button or double click the left mouse button on its name;
- to re-arrange the list of responsible base stations, use "Up" and "Down" buttons.

Note: The zone name is displayed in the line, which describes this zone in "Chart Objects List" dialogue box.

Check of Transas Target Manager Sensor Availability

For the operation of Navi-Harbour/Navi-Traffic with AIS transponders, Transas Target Manager sensor is required. Check that this sensor is available in the sensor configuration.

5.2 FIRST RUN AND OPERATION CHECK

5.2.1 Check of Software Component Start

After the end of AIS Server and ODU 0 configuring, turn in AIS Server and ODU 0 computers. Check that the following software components have been run on the computers:

- AIS Server:
  - UAIS Server program.
- ODU 0
  - ODU 0 program;
  - VARP Integrator2 program.

Switch ODU 0 to “Function” mode and check that connection with the AIS Server has been established.

5.2.2 Turning on of Transponder Power Supply

Turn on the transponder power supply. If Transas T200/T201 transponder is fitted out with the supply remote control switch, open the transponder control panel and turn on the power supply by using the appropriate controls.

5.2.3 Check of Transponder Connection

On the main AIS Server panel in “Connection” unit, check the status of connection with the main and backup (if available) set of transponders. If the power supply of the device is turned on, the connection status should be “Connected”. If after the power supply has been turned off, the status remains “Disconnected”, check the settings of serial ports and the connecting cable.

5.2.4 Check of Synchronising with UTC Time

After the connection with the transponder has been established, check the supply of UTC time information from the base station transponder (if Message 1 or Message 4 sources are used). If UTC time is supplied, UTC Time field of Statistics group will display the time. If synchronising messages do not arrive, this field displays “n/a” status. Make synchronising messages start to arrive.

Note: If Local value is selected for the time source, UTC Time field will always display the computer local time. Check that it has been synchronised with UTC.

If Message 1 has been selected for the source, it is only seconds which are synchronised with UTC (date, hours and minutes are not synchronised). This mode is allowed for use.

If UTC time is present on AIS Server panel, check the availability of synchronising with Integrator program. To do this, pay attention to the main panel of VARP Integrator program. Select “AIS” line from the list of sensors, and to the right of the list, check that:

- UTC status is “OK”. If UTC status is “Error”, check the availability of UTC time on AIS Server and network connection of ODU 0 and AIS Server;
- Targets line shows the number of AIS targets.

5.2.5 AIS Transponder Status Diagnostics Panel

ON ODU 0, you can open the AIS Transponder Status Diagnostics Panel which enables continuous monitoring of the AIS Transponder status in “Function” mode. To open this panel:

- select WINDOW\DIAGNOSTICS PANEL\AIS TRANSPONDERS if it is unchecked or
- select WINDOW\STATUS:AIS TRANSPONDERS. If there is no such item, press More windows and select STATUS:AIS TRANSPONDERS in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Data displayed	Status
Name	Transponder name	
Connection	Availability of connection	Green – there is connection Red – no connection Transparent – in Standby and Demo modes
Status	Availability of a diagnostics message about faulty active transponder	Green – there is data Red – there is no correct data; Transparent – in Standby and Demo mode

“Status” column diagnoses availability of a fault connected with:

- Transmitter;
- Antenna/feeder;
- Receiver Ch.1;
- Receiver Ch.2;
- Receiver Ch.70;
- General failure;
- GNSS sensor.

CHAPTER 6

Audio Information Server

This chapter contains necessary data for the Audio Information Server installation and adjustment.

Copyright Transas Marine Ltd., 2003

6.1 GENERAL

Navi-Harbour software has a capability to record audio information synchronously with other VTS information.

To ensure the audio information recording capability, the system includes Audio Information Server which digitises, compresses and transfers audio information to the VTS Server for its re-recording and playback.

Audio Information Server is a computer operating under the control of Windows 2000, with dedicated hardware and software installed in it.

The number of processed audio channels is determined by the system needs and, depending on the type of dedicated hardware in use, is selected from the range of 2 to 16.

6.2 COMPUTER AND OS REQUIREMENTS

6.2.1 AUdio Information Server Computer

For the Audio Information Server, it is necessary to prepare a computer meeting the requirements set forth in this paragraph, install Microsoft Windows 2000 (English or Russian version) SP 2 on it.

For the Audio Information Server to operate normally, the computer should meet the requirements specified in the table below:

Characteristic	Minimum requirement	Recommended
Processor	PIII/600 MHz	PIII/1000 MHz
RAM	128Mb	256 Mb
Video adapter	4Mb AGP or PCI	8Mb AGP or PCI
Hard disk	4Gb	
CD drive	Required	
Free slots	Up to 4xPCI or 4xISA depending on the digitising card type and number of channels	
Network adapter	Ethernet/Fast Ethernet	
Operating system	Windows 2000 SP2 English/US version	
Maintenance monitor	15'', 1024x768/75Hz	
Keyboard, mouse	Standard	
Free hardware interrupt	IRQ11 for Olkha 24M cards	

6.2.2 Operating System Installation

Materials Required: installation license Microsoft Windows 2000 Service Pack 2 CD.

Audio Information Server software operates under Microsoft Windows 2000, English/US version, Service Pack 2. Installation of the operating system should be made by a qualified specialist holding an appropriate Microsoft certificate. Follow an appropriate installation instruction provided by Microsoft Corporation. The following components should be installed:

- Video adapter driver;
- Network drivers for all network adapters installed in this computer;
- TCP/IP protocol.

For TCP/IP or "Workgroup"/"Domain" settings consult your network administrator.

Check of Network Software Adjustment

To check the correctness of IP address setting and to find out the IP address when it is received from the DHCP server, use the following procedure:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ipconfig” and press <Enter>.
3. List of IP addresses for every network adapter will be shown.

Check of TCP/IP Connection

It is necessary to check that TCP/IP connection between radar processor computer and ODU 0 has been established. To check TCP/IP connection between two computers use the following procedure for the both computers:

1. Select START\PROGRAMS\ACCESSORIES\COMMAND PROMPT to run MS DOS Prompt.
2. Type “ping IP_ADDRESS” where IP_ADDRESS is the IP address of another computer, and press <Enter>.
3. Check that other computer responds to the requests. In this case the screen should display “Reply from IP_ADDRESS:” messages.

6.3 HARDWARE INSTALLATION

6.3.1 Types of Sound Digitising Cards in Use

For the digitising of audio information, the Audio Information Server can use the following types of cards with appropriate limitations on the number of audio channels:

N	Name	Number of channels on the card	Maximum number of cards	Maximum number of channels
1	M-Audio Delta 44 (PCI)	4	4	16
2	Sound Blaster Live! (PCI)	2	1	2
3	Olkha 24M (ISA)	4	3	12

6.3.2 Installation of Delta 44 and Sound Blaster Cards

Installation of Delta 44 and Sound Blaster type cards requires no preparatory operations. Disconnect the computer power supply and insert cards in the vacant PCI slots.

6.3.3 Installation of Olkha 24M Cards

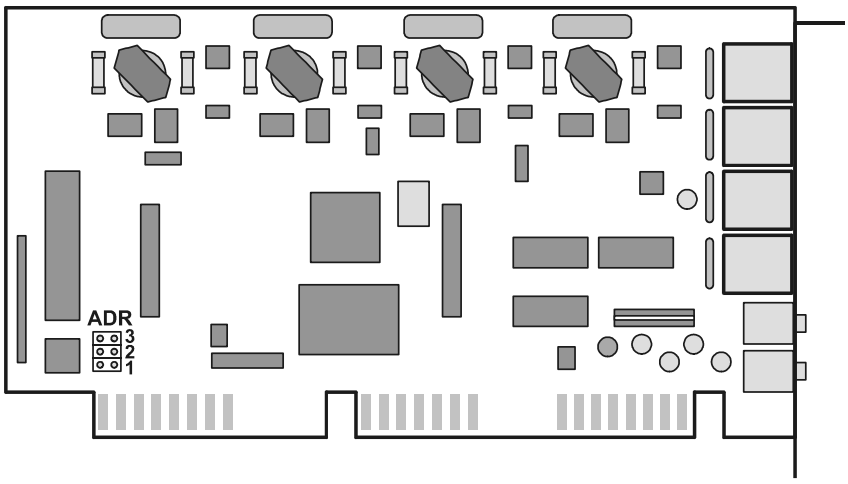
Computer Resource Assignment

Before the installation of ISA Olkha 24M card in the Audio Information Server computer, assign the interrupt. To do this, open the computer BIOS settings and set ISA Legacy value for IRQ11.

Setting the Base Address

Each of the boards occupies four adjacent addresses in the computer's input/output area, and should be adjusted to the individual base address not used by other computer boards and resources.

The setting of a specific address is achieved by using jumpers as shown in Figure and Table below:



Possible Board Addresses

Address Range	Position of ADR Jumpers
220H – 223H	3 2 1
224H – 227H	3 2 1
228H – 22BH	3 2 1
22CH – 22FH	3 2 1
230H – 233H	3 2 1
234H – 237H	3 2 1
238H – 23BH	3 2 1
23CH – 23FH	3 2 1

Installation of Cards in the Computer

Having performed preparatory operations, disconnect the computer power supply and insert the cards into vacant ISA slots.

6.4 SOFTWARE INSTALLATION

6.4.1 List of Audio Information Server Software Modules

The following software modules are required to be installed on the Audio Information Server computer:

1. Sound Server program.
2. Sound digitising card drivers.
3. Component for synchronising Audio Information Server and VTS Server time.

For Olkha 24M cards only – `Aldertst.exe` program for the signal level adjustment.

6.4.2 Installation of Sound Server Program

To install the program, use the Navi-Harbour software license disk and ODU0 license. Follow the procedure detailed in sec.2.5.

After the installation of ODU software, create a desktop shortcut for `Soundserv.exe` program stored in the folder where ODU software is installed.

For Sound Server program to be run automatically, copy the newly created shortcut to “Startup” folder.

6.4.3 Installation of Sound Digitising Card Drivers

Installation of Delta 44 and Sound Blaster Card Drivers

To install drivers for Delta 44 and Sound Blaster cards, use procedures detailed in the documentation supplied with these cards.

Installation of Olkha 24M Card Drivers

With the use of “Olkha 24M” cards, install Olkha ActiveX Control software containing drivers and stored on Navi-Harbour license disk:

- Open *\AlderDrv* folder of the installation disk and run `OCX15.EXE` program;
- select”Typical” installation type.

6.4.4 Installation of Aldertst program

With the use of Olkha 24M cards, it is necessary to install `Aldertst.exe` program which will be used for the adjustment of analog signal levels.

For the installation, copy all the files from *\AlderDrv\Drivers* folder of Navi-Harbour installation disk to a directory on the local disk.

ATTENTION!

Aldertst program can be used for the adjustment of signal levels only. Operation of this program simultaneously with Sound Server is not permitted. After the adjustment of signal levels, it is necessary to rule out possibility of an inadvertent start of Aldertst program during Sound Server operation.

6.4.5 Time Synchronising Component Installation

Install timer synchronising component of the Audio Information Server computer as detailed in sec.2.11.

6.5 ADJUSTMENT OF SIGNAL LEVELS

6.5.1 For Delta 44 Cards

For the adjustment of the input signal level for Delta 44 card, use the procedure detailed in the “Hardware settings page” of documentation supplied together with the card.

6.5.2 For Sound Blaster Cards

By using the standard Windows panel for the adjustment of the recording level, set the input signal amplitude for the left and right Sound Blaster channels.

6.5.3 For Olkha 24M Cards

For each Olkha 24M card, the following parameters should be set

Audio Signal Level Adjustments

To adjust audio signal level of “Olkha 24M” card channel, use `Aldertst.exe` program included in the delivery set of the card drivers. After the program start, the following values should be set:

1. “Base port” – value of the card input/output base address.
2. “Interrupt” – interrupt value of 11.
3. “Line” – number of “Olkha” card channel.
4. “Discretisation” – 8 kHz.

It is then necessary to open the channel by pressing “Open” button and set the following values:

1. “Line type” – “Line input” value.
2. “Compression” – PCM.

You can the use “Gain” button for the control of audio signal gain.

Acoustostart Threshold Adjustment

Acoustostart function is used for cutting off noise components of audio signal. Audio signal below the acoustostart threshold is not sent and not processed by the software.

To adjust Acoustostart threshold, press “Acoustostart” button. Use “Acoustostart” slider to adjust the acoustostart triggering threshold so as to cut off noise components for the signal and to enable passing of the useful signal. In doing so, monitor the acoustostart triggering by the lighting of “Acoustostart” lamp in the main window of the application.

For “Acoustostop” leave the default value.

6.6 ADJUSTMENT OF SOUND SERVER PROGRAM

6.6.1 Operating System Automatic Reboot

In case some fatal errors occur in the program, there is a facility for rebooting automatically the operating system of the computer where the sound server is operating. This facility is adjusted in `SoundServ.ini` configuration file by using the following procedure:

Create [Mode] section where RebootOnError=1 or RebootOnError=on string should be added.

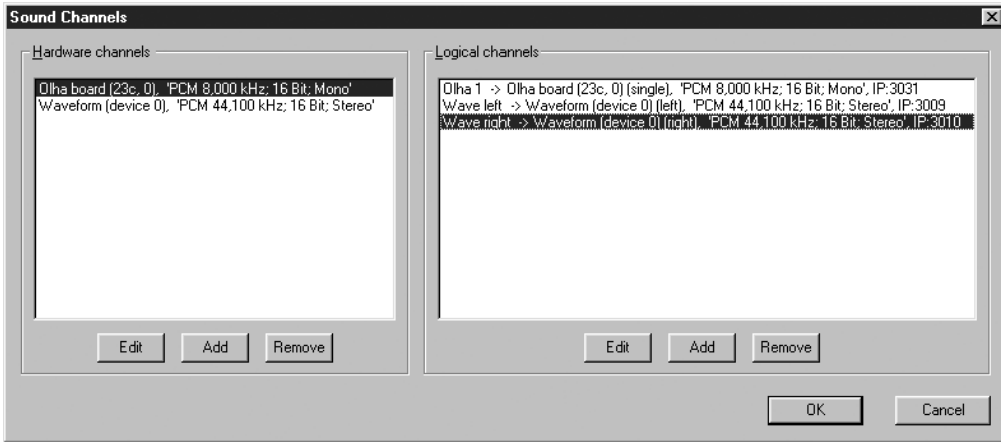
The aforementioned capability is ignored in the debug mode (when [Debug] section specifies that DebugMode=1).

Note: To reboot the operating system adjusted as described above, Windows user should have an authority to reboot the system.

6.6.2 Adjustment of Audio Information Channels

Start `SoundServ.exe` program: the screen will display “Sound Server” dialogue window.

Press “Properties” button: the screen will display “Sound Channels” dialogue window.


Sound Channels
Hardware channels
Olha board (23c, 0), 'PCM 8,000 kHz; 16 Bit; Mono'
Waveform (device 0), 'PCM 44,100 kHz; 16 Bit; Stereo'
Edit
Add
Remove
Logical channels
Olha 1 -> Olha board (23c, 0) (single), 'PCM 8,000 kHz; 16 Bit; Mono', IP:3031
Wave left -> Waveform (device 0) (left), 'PCM 44,100 kHz; 16 Bit; Stereo', IP:3009
Wave right -> Waveform (device 0) (right), 'PCM 44,100 kHz; 16 Bit; Stereo', IP:3010
Edit
Add
Remove
OK
Cancel

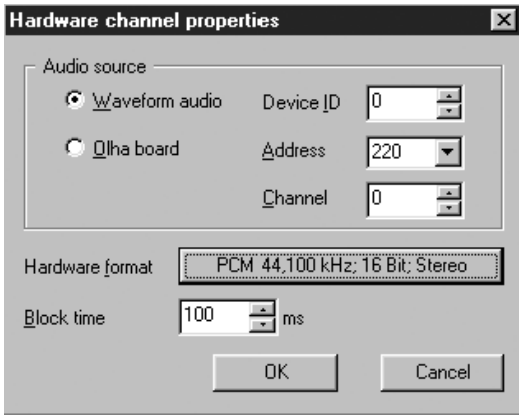
Creating of Hardware Channels

In the left hand part of “Sound Channels” window, there is a list of devices (Hardware channels). Depending on the type and number of sound digitising cards in use, the appropriate number of devices should be created, being guided by the following principles:

- Each Delta 44 card contains two stereo units;
- Sound Blaster card contains one stereo unit;
- Each Olkha 24M card contains 4 mono units.

For each of the described above devices its own channel should be added to “Hardware Channels” section:

1. Press "Add" button of “Hardware Channels” section: the screen will display “Hardware Channel Properties” dialogue window shown on the drawing below:



2. In “Audio Source” section, set the type and parameters of the sound source:
   – set “Waveform Audio” radio button for the sound blaster and the ID number of the device;
   – set “Olha Board” radio button for “Olha” board and then specify the base input/output address and the number of the channel in use.
3. Press "Hardware Format" button with the specified recording format to change this format: “Select Sound Format” dialogue window will appear;
4. From the drop-down “Attributes” list, select audio information digitising format.
   – for Sound Blaster and Delta 44 cards – any Stereo format providing the optimum value for the given source of sound. The recommended format is – PCM, 8,000 kHz; 8 Bit; Stereo.
   – for Olkha 24M cards – PCM, 8,000 kHz; 16 Bit; Mono
5. For “Block time” leave the default value.

Note: In case of “Olha” board, up to 4 channels can be added to “Hardware Channels” section.

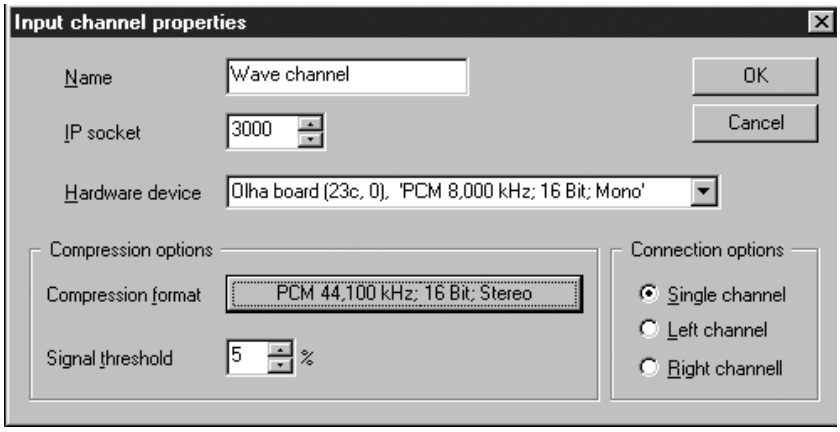
Creating of Logical Channels

In the right hand part of “Sound Channels” window, there is a list of acoustic channels (Logical channels). Depending on the type and number of devices (Hardware channels), it is necessary to create an appropriate number of acoustic channels being guided by the following principles:

- each Stereo unit contains two acoustic channels: left and right channel;
- each Mono unit contains a single acoustic channel.

For each of the aforementioned acoustic channels, it is necessary to add its own logical channel:

1. Press "Add" button of “Logical Channels” section: the screen will display “Input Channel Properties” dialogue window shown in the drawing below:



2. Enter the name of this channel in “Name” text field.
3. Use “IP Socket” spin box to enter the number of the IP port which is required to be set in the configuration of the relevant sensor.
4. From “Hardware Device” drop-down list, select the appropriate channel of “Hardware Channels” section.
5. In “Compression Options” section, select the format of data transmission to the client (press “Compression Format” button). This format should always be Mono, and it is advisable to set the rest of the parameters the same as in the corresponding hardware channel.
6. For Sound Blaster and Delta 44 cards, set the Signal threshold (signals below this threshold are not recorded). For Olkha 24M leave the default value – in this card, this parameter is adjusted in Autostart parameters.
7. Use the radio buttons of “Connection Options” section to select the acoustic channels of the device:
   – where Olkha 24M board is used, set “Single Channel”;
   – where the Sound Blaster и Delta 44 are used as two different channels, set “Left Channel” for the connection of the sound source connected to the left channel of the sound blaster’s stereophonic input, and “Right Channel” for the connection of the sound source connected to the right channel.

6.7 ADJUSTMENT OF ODU FOR OPERATION WITH SOUND SERVER

6.7.1 Creating an Audio Type Sensor

For each track containing recordings of a single sound source, a separate AUDIO type sensor is required to be added. Edit the sensor configuration by supplementing it with AUDIO type sensor as described in sec.2.8.7. Enter the following channel parameters in “General” dialogue window:

- use “Name” text field to enter the channel’s name;
- use “IP Address” field to enter the address of the IP computer running the SoundServ program which digitises this channel recordings;
- use “IP Port” field to enter the number of the IP port which should be referred to for obtaining the data.

Note: IP Port number should match the number specified in SoundServ program in “Input Channel Properties” dialogue window.

6.7.2 Selection of Audio Channels for Playback

The software performing the audio recording simultaneously passes audio information for the synchronous presentation on an ODU. Navi-Harbour software enables the mixing of sound from different sources for the simultaneous playback during the work sessions.

To select audio channels use the following procedure:

- select SENSOR\AUDIO\AUDIO CHANNELS...: the screen will display “Audio channels” dialogue box;
- in “Play channels” check the checkboxes of those channels which are required to be played back;
- press “OK” button.

Note: Where Audio type sensors are not available in the configuration, the aforementioned menu item is absent.

The sound mixing capability is currently available with the use of SoundBlaster Live only.

Corresponding to each of the audio channels should be its own channel in “Logical channels” section of SoundServ program.

6.8 AUDIO SENSOR STATUS DIAGNOSTICS PANEL

The diagnostics panel enables the continuous monitoring of the Audio sensor status. To open this panel:

- select WINDOW\DIAGNOSTICS PANEL\AUDIO CHANNELS if it is unchecked or
- select WINDOW\STATUS: AUDIO CHANNELS. If there is no such item, press MORE windows and select Status: Audio Channels in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Data displayed	Status
Name	Sensor name	
Connection	Availability of connection	Green – there is connection Red – no connection Transparent – in Standby and Demo modes
Alarms	Availability of alarms	Green – there is no alarms Red – there is an alarm; Transparent – in Standby and Demo mode

6.9 GENERATION OF AUDIO RECORDER ALARMS

In case of an error in the SoundServ program channels, even if only in one of them, ODU Message Window displays “Channel_name – Failure” message. In addition, a red lamp corresponding to this alarm lights up in ODU 0\AUDIO\<CHANNEL_NAME>\STATUS item in "System Status" window displayed By Components and the alarm type is displayed in “Value” column.

6.10 ADJUSTMENT OF THE RECORDING LEVEL

To adjust the recording level of “OLKHA” board channel, it is necessary to use `Aldertst.exe` program included in the board driver delivery set.

Note: During the installation of “OLKHA” board software (`OCX15.EXE`), board drivers are also installed, so not additional driver installation is required.

CHAPTER 7

Video Surveillance System

This chapter contains useful information for handling Video Surveillance system.

Copyright Transas Marine Ltd., 2003

7.1 LIST OF COMPATIBLE EQUIPMENT

Remotely controlled turning devices of the following types can be connected to Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS:

- Transas P&TC-610;
- Sagebrush Gimbal M-20.

7.2 CONNECTION OF CCTV CAMERAS AND ADJUSTMENT OF OPERATION WITH THEM

7.2.1 Creating of VTS Chart Object

Where surveillance system is used in the work with the Navi-Harbour system, create “CCTV cameras” type VTS object and plot it on the chart in the position of the turning device installation.

Control of the video surveillance system is prohibited if there is no “CCTV cameras” object on the VTS chart.

7.2.2 Creating of CCTV Controllers Sensor

Edit the configuration of sensors as detailed in sec.2.8.7 of this Manual in order to add CCTV Controllers class sensor:

- enter the CCTV camera (VTS chart object) identifier corresponding to the connected CCTV camera, in “CCTV ID” spin box;
- enter the sensor name in “CCTV Name” field;
- check “Wiper” and “Washer” checkboxes if the CCTV camera in use is fitted out with these devices;
- in “Parameters” dialogue window, select CCD size parameters and parameters of the objective lens in the camera:
  - use “Diagonal size” pull-down list to select the value of the parameter specified on the camera case, whereafter “Horizontal size” and “Vertical size” spin boxes will display the appropriate values accessible for editing;
  - in “Lens type” pull-down list, select:

    “Zoom lens” if the zoom is available, enter the limit values for the focus distance specified on the casing of the zoom lens in use, or
    “Fix. FL” if the zoom lens is not used, and enter the value of the focus distance.
- in “Pan and Tilt Setup” dialogue window, enter the CCTV camera pan and tilt angle parameters (presentation accuracy is 0.1 degree):
  - permissible range of left and right azimuth limit, as well as values of the upper and lower elevation limits is specified in the dialogue box.

- for Gimbal M-20 sensor, you can set the correction of the CCTV camera vertical position in “Vertical correction” dialogue box:
  - check “Enable vertical correction” checkbox;
  - select three reference points, for each of them specify:

    point azimuth (in “Azimuth” spinbox);
    correction (value in degrees which should be added to the value of the current CCTV camera tilt angle, for a reference point which the camera is focused on, to be in the centre of the screen).

Note: The admissible range for correction values is from – 10º to 10º.

Average correction value should not exceed 5º.

Azimuths of reference points in pairs differ by at least 1º.

- in “Zoom Lens Setup” dialogue box (if the objective type with zoom lens is selected) choose zoom and focus control parameters:
  - use “Focus Control from” and “to” spin boxes to enter the values corresponding to the minimum and maximum values of the focus distance;
  - select the way of showing zoom and focus parameters in the CCTV camera control dialogue box: in per cent of units.
- if an objective lens type with a zoom is selected, use “Auto focus setup” window boxes to enter the auto focus parameters corresponding to the zoom values specified to the right;
- use “Pan Correction” dialogue window for setting the azimuth correction function:
  - check “Use azimuth correction” checkbox to enable the use of the correction table;
  - split the CCTV camera rotation interval into 18 equal parts and enter turn angle values in “P&T value” spin boxes;
  - for each azimuth angle sent to the camera (value in ”P&T value” spin box), enter a correcting value received from the camera in “Real value” spin box;
  - entered values are required to be strictly in ascending order;
  - use “Restore defaults” button to restore default values in the table.
- select the connection type in use in “Connection” dialogue window:
  - “Local” if the sensor is connected to ODU 0, and enter COM port parameters, or
  - “Network” if the sensor is connected to the remote computer, and enter IP address and the IP port number of the computer which the sensor is connected to.

7.3 VIDEO SURVEILLANCE SYSTEM DIAGNOSTICS

7.3.1 Video Surveillance System Diagnostics Panel

On ODU 0, you can open the panel showing diagnostics of video surveillance system enabling continuous surveillance of the CCTV camera status in “Function” mode. To open the panel:

- select WINDOW\DIAGNOSTICS PANEL\CCTV CAMERAS menu item if there is no marker to its left; or
- Select WINDOW\CCTV CAMERAS menu item. If there is no such menu item, press MORE WINDOWS... and select STATUS:CCTV CAMERAS in the window which will appear.

The status of the sensor is indicated with circles in various colours. The panel displays the following information:

Column	Displayed data	Status
Name	CCTV Camera name	
Connection	Availability of connection	Green – there is connection Red– no connection Transparent– in Standby and Demo modes
Data	Availability of correct data	Green – there is data Red – no correct data Transparent– in Standby and Demo modes or recording OFF

7.3.2 Diagnostics in System Status Window

System Status window shown by components, displays diagnostics of the CCTV camera position:

- select ODU 0\CCTV CAMERAS\<CAMERA NAME>\SENSOR DATA menu item in the status tree:
  - Control values – values set on the CCTV camera control panel;
  - Sensor values – values received from the camera.

Diagnostics of the CCTV camera’s vertical position are shown in ODU N\CCTV CAMERAS\<CAMERA NAME>\SENSOR DATA\VERTICAL CORRECTION status tree element.

ODU N\CCTV CAMERAS\<CAMERA NAME>\SENSOR DIAGNOSTICS\ALARM/STATUS\SPEED\ACCELERATION status tree element sows the CCTV camera speed and acceleration.

In case of any faults in the CCTV camera, the Message Window provides “CCTV <name> – failure” alarm.

CHAPTER 8

VHF Direction Finder

This chapter contains useful information for handling VHF Direction finders.

Copyright Transas Marine Ltd., 2003

8.1 LIST OF COMPATIBLE DIRECTION FINDERS

Direction finders of the following types can be connected to the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems:

- C.PLATH ARCUS M;
- ROHDE&SCHWARZ PA 100/200/120.

8.2 MODES OF OPERATION WITH DIRECTION FINDERS

Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems can provide the operators with data received from the direction finders. When the bearing data is received, the lines showing the direction of bearings can be displayed in the navigation windows of the operator modules. Data from the direction finders, like from other sensors, can be recorded by using the recording procedure for the further full playback of the navigational situation dynamics.

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS system are not capable of controlling the direction finders, or of their diagnostics. The direction finders' standard facilities, e.g, separate computers, are used for the control and diagnostics.

8.3 VTS CONNECTION OPTIONS

The direction finder can be connected via a serial port to ODU 0 or any remote computer available via a modem of Ethernet.

If the direction finder is connected direct to ODU 0, no additional software components are required to be installed.

If the direction finder is connected to another VTS computer, the following components should be installed on it:

- Microsoft Windows 2000 OS (English or Russian version) Service Pack 2;
- Service COMMUX software (see sec.13.1 of this Manual);
- Network adapter(s) and appropriate drivers if communication with ODU 0 is via LAN;
- Remote access service if a modem will be used;
- TCP/IP protocol.

8.4 EQUIPMENT REQUIREMENTS

8.4.1 Preparation for the Installation

The direction finders used as sensors of Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems should be installed and adjusted in accordance with their associated documentation.

8.4.2 Connection of Direction Finders

The direction finder used as a VTS system sensor, should be configured in accordance with its associated documentation so that the control and diagnostics are carried out via one of the direction finder's interface port, whilst the operating data is transmitted via another port.

The direction finder control unit is connected to the direction finder via the control and diagnostics port.

The direction finder data port is connected to the serial ports of the selected VTS system computer.

8.5 CONFIGURING ODU 0 FOR THE OPERATION WITH DIRECTION FINDERS

To configure ODU 0 for the operation with direction finders, perform the following actions:

- create “Direction finder antennae” type VTS object and place it on the chart;
- create direction finder type sensor as described below.

8.5.1 Creating Direction Finder Type Sensor

Edit Sensor Configuration on ODU 0 computer as described in sec.2.8.7 to add Direction Finder type sensor. Enter the parameters specified in the paragraph below.

8.5.2 Parameters of Direction Finder Type Sensor

When a Direction Finder type sensor is added, the screen displays “Direction Finder ID” dialogue box:

- enter the Direction Finder ID in “Direction Finder ID” spin box;
- enter the Direction Finder name in “Direction Finder Name”;
- select the type of connection in “Connection” dialogue box:
  - use “Local” radio button if the sensor is connected to ODU 0, or
  - use “Network” radio button if the sensor is connected to a remote computer:

    enter the COM port parameters for the local connection, or
    enter the IP address and IP socket number of the computer whose serial port the sensor is connected to for the network connection.

ATTENTION!

IP socket number must be coincident with that specified in the COMMUX program’s command line (see sec. 13.1).

8.5.3 Direction Finder Status Diagnostics Panel

The diagnostics panel enables the continuous monitoring of the direction finder status in “Function” mode. To open this panel:

- select WINDOW\DIAGNOSTICS PANEL\DIRECTION FINDERS if it is unchecked or
- select WINDOW\STATUS:DIRECTION FINDERS. If there is no such item, press More windows and select Status:Direction Finders in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Data displayed	Status
Name	DF name	
Connection	Availability of connection	Green – there is connection Red – no connection Transparent – in Standby and Demo modes
Data	Availability of correct data	Green – there is data Red – there is no correct data; Transparent – in Standby and Demo mode

The indication of a connection error for the sensors connected via COM port is that no data is supplied to the port for a set period of time (for ArcusM bearing finder – 2 seconds, for Rohde&Schwarz bearing finder – 10 minutes).

8.6 DIAGNOSTICS OF DIRECTION FINDERS CONDITION IN THE SYSTEM STATUS WINDOW

Open System Status window (select WINDOW\SYSTEM STATUS menu item), select BY COMPONENTS display. The condition of direction finders is shown in ODU 0\DIRECTION FINDERS item. For Rohde and Schwarz direction finders, FaultStatus item is responsible for the availability of correct data from the direction finder.

CHAPTER 9

Radar ARPA

This chapter contains useful information for handling radars in ARPA operation mode.

Copyright Transas Marine Ltd., 2003

9.1 LIST OF COMPATIBLE RADARS IN ARPA MODE

Radars of the following type can be connected to the Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems for the operation in ARPA mode:

- Litton BridgeMaster ARPA;
- Sperry Rascar 3400;
- Atlas 8600.

9.2 PREPARATION FOR THE INSTALLATION

The radars used as ARPA sensors should be installed, adjusted and tested in accordance with the documentation for these radars.

9.3 VTS CONNECTION OPTIONS

Radar/ARPA can be connected via a serial port to ODU 0 or any remote computer available via a modem of Ethernet.

If the ARPA is connected direct to ODU 0, no additional software components are required to be installed.

If the ARPA is connected to another VTS computer, the following components should be installed on it:

- Microsoft Windows 2000 OS (English/US version) Service Pack 2;
- Service COMMUX software (see sec.13.1 of this Manual);
- Network adapter(s) and appropriate drivers if communication with ODU 0 is via LAN;
- Remote access service if a modem will be used;
- TCP/IP protocol.

9.4 CONNECTION TO BRIDGEMASTER ARPA

9.4.1 Equipment Requirements

The BridgeMaster ARPA equipment designed for the operation as a sensor of the Navi-Harbour 1000/2000/3000 or Navi-Traffic VTS systems, should include the following components:

- BridgeMaster ARPA system including:
  - radar antenna;
  - radar scanner unit with a transceiver and antenna rotation unit;
  - radar console with Autotrack option;
  - standard set of radar cables.
- Compass or compass imitator including:
  - DC 20-50V power supply;
  - 3 10-20 kOhm resistances.

The VTS system computer which the radar should be connected to, is required to have a free RS-232 or RS-485 port for the connection.

A screened twisted pair cable with connectors corresponding to the wiring diagram is required for the connection of the radar to the VTS system computer.

9.4.2 Supported Protocols

Navi-Harbour 3.7 software supports receiving information from ARPA radars via NMEA 183 protocol. This protocol should be chosen when entering sensor's parameters in the process of configuring Navi-Harbour software.

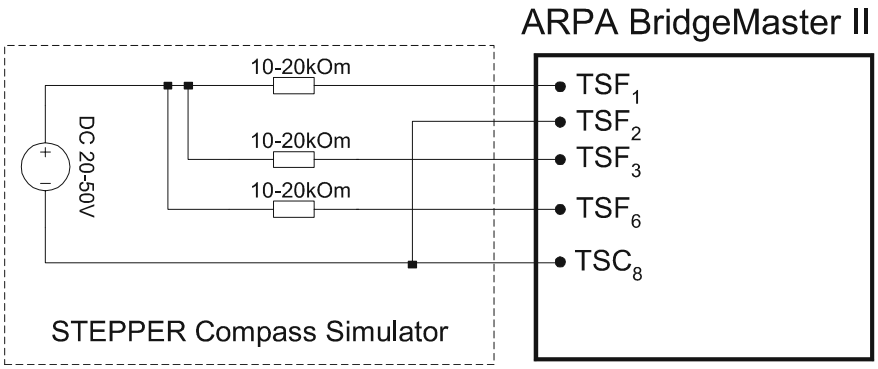
9.4.3 Compass Connection

With the use of BridgeMaster APRA/radar as Navi-Harbour system sensor using the autotracking option, it is necessary to provide input of information on the scanner's current orientation (course) into the radar. When BridgeMaster radar is used as a coastal sensor, whereby the scanner's orientation does not change in time, you can use one of the following procedures:

- connect to the radar one of the compass types listed in the **SHIP'S MANUAL**;
- in the absence of a compass, connect to the radar an imitator compass.

Procedures for connecting various compass types to BridgeMaster radar and their adjustment are detailed in the **Ship's Manual**.

The imitator compass is a DC power source with a voltage from 20 to 50 V, and three resistors of 10 – 20 kOm. A diagram of connecting the imitator compass to the BridgeMaster display is provided in the drawing below.



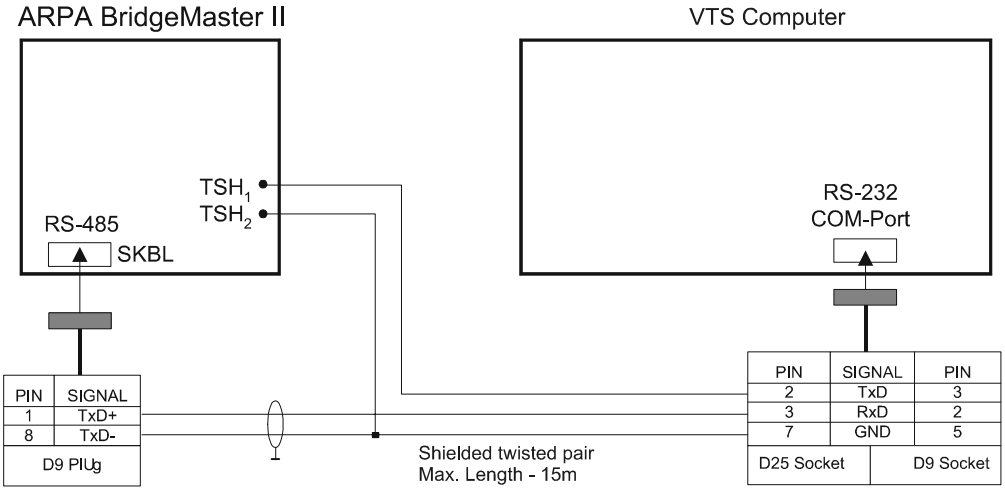
This configuration and connection diagram imitate the connection of STEPPER COMPASS type compass with a positive Reference Polarity. This being so, it is necessary to check the correctness of the cable connection inside the BridgeMaster display using the procedures described in the **Ship's Manual**.

Note: When the imitator compass is used as a source of data on the scanner orientation (course), each time the BridgeMaster display is connected to the power supply, the course value should be entered manually.

9.4.4 Connection to the VTS System Computer

Bridgemaster ARPA can be connected to any VTS system computer operating under Microsoft Windows 2000 and having a free RS-232 or RS-485 port.

To connect the BridgeMaster ARPA to the VTS system as a source of data on ARPA tracked targets, connect the BridgeMaster display and the selected serial computer port with the screened twisted pair cable. The connection diagram is shown in the drawing below.



9.4.5 Configuring BridgeMaster ARPA

Turning on Autotrack Option

To enable the target tracking by the display/ARPA, it is necessary to check that an appropriate option is included in BridgeMaster display configuration. To do this use the following procedure:

- open the menu by pressing <Menu> button on the keyboard;
- select MORE item to display MENU2;
- select INITIALISATION item;
- select SYSTEM OPTIONS item;
- set AUTOTRACK option to “YES”.

Selecting format for the target data output

To ensure the output of data on the ARPA tracked targets in a format accepted by Navi-Harbour software, it is first necessary to check that the required format has been selected in BridgeMaster display configuration. To do this use the following procedure:

- open the menu by pressing <Menu> button on the keyboard;
- select MORE item to display MENU2;
- select INITIALISATION item;
- select I/O OPTIONS item;
- select MORE item to display I/O OPTIONS 2;
- set TARGET O/P item to “NMEA”.

Turning off autodrop option

Autodrop option is used in the ship radars for the automatic cancelling of targets situated at a safe distance from the own ship. If the BridgeMaster is used as coastal radar, this option should be turned off. To do this use the following procedure:

- open the menu by pressing “Menu” button on the keyboard;
- select MORE item to display MENU2;
- select INITIALISATION item;
- select SYSTEM SETUP item;
- select MORE item to display SYSTEM SETUP 2;
- set AUTODROP option to “NO”.

9.5 CONNECTION TO SPERRY RASCAR 3400 ARPA

9.5.1 Equipment Requirements

SPERRY RASCAR 3400 ARPA intended for the operation as a sensor of Navi-Harbour 1000/2000/3000 or Navi-Traffic VTS system, should have an option of target data input/output on the external port.

The VTS system computer which this radar will be connected to, should have a free RS-232 port for the connection.

A screened twisted pair cable with connectors corresponding to the wiring diagram is required for the connection of the radar to the VTS system computer.

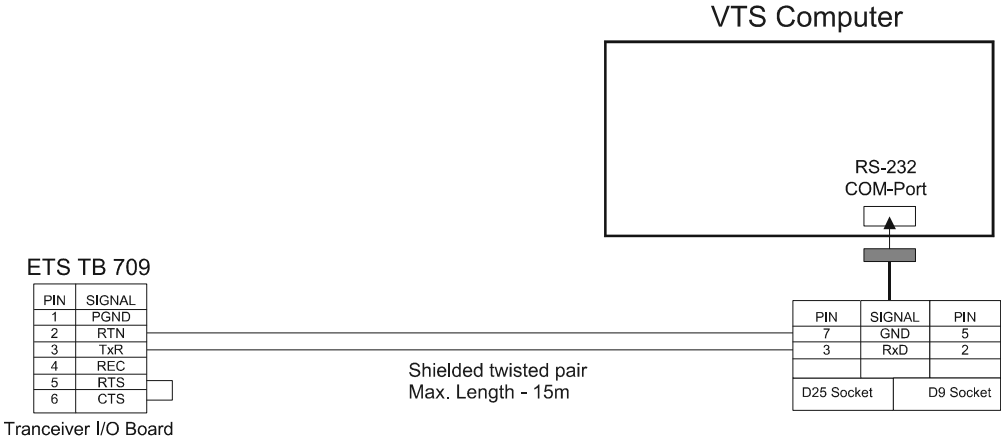
9.5.2 Supported Protocols

NAVI-HARBOUR ver. 3.7 supports NMEA 183 format. This protocol should be chosen when entering SPERRY RASCAR 3400 ARPA sensor parameters at the time of Navi-Harbour software adjustment (see sec.9.7.3).

9.5.3 Connection to the VTS System Computer

SPERRY RASCAR 3400 ARPA can be connected to any VTS system computer operating under Microsoft Windows 2000 and having a free RS-232 port.

To connect the SPERRY RASCAR 3400 ARPA to the VTS system as a source of data on ARPA tracked targets, connect the ARPA display and the selected serial computer port with the screened twisted pair cable. The connection diagram is shown in the drawing below.



9.5.4 Configuring of Sperry Rascar 3400 ARPA

Each time after the ARPA is switched on, the output of target data should be permitted via the menu, as SPERRY RASCAR ARPA does not save this setting.

9.6 CONNECTION TO ATLAS 8600 ARPA

9.6.1 Equipment Requirements

VTS computer, which the given radar will be connected to, should have free RS-232 port.

Required is screened twisted pair cable with terminators corresponding to connection schedule of radar to the VTS computer.

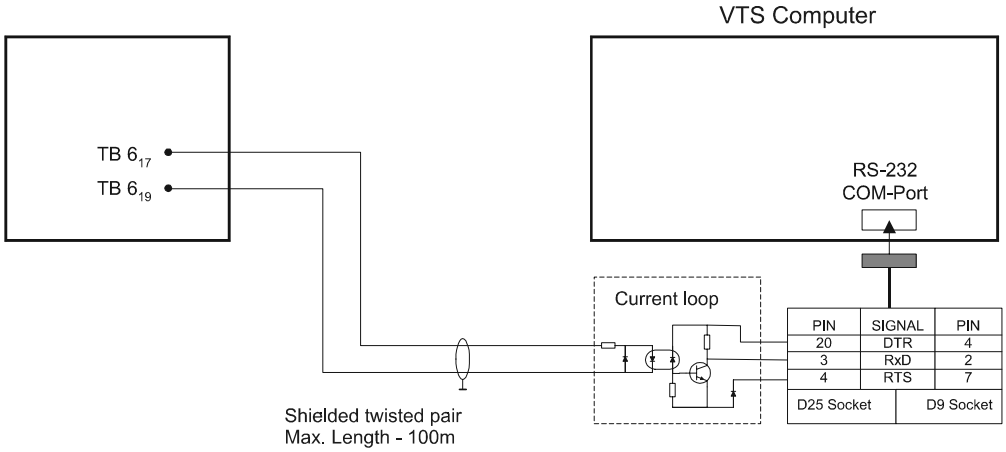
9.6.2 Supported Protocols

ATLAS 8600 radar/ARPA has its own interface of target data transfer. This format should be chosen when entering ATLAS 8600 ARPA sensor parameters at the time of Navi-Harbour software adjustment (see p.183).

9.6.3 Connection to the VTS Computer

ATLAS 8600 ARPA radar can be connected to any VTS computer operating under Microsoft Windows 2000 operating system and having a free RS-232 interface port.

To connect ATLAS 8600 ARPA as a source of data on ARPA- tracked targets to the VTS system, connect the radar console and the selected computer serial port with screened twisted pair cable. Connection schedule is displayed in the drawing below.



9.7 CONFIGURING ODU 0 FOR OPERATION WITH ARPA RADARS

9.7.1 Creating of “Radars” Object

To configure ODU 0 for the operation with ARPA radar type sensor it is necessary to create a VTS object of “Radars” type and to place it on the chart (see sec.2.8.6 of this manual).

9.7.2 Creating an ARPA Sensor

Edit Sensor Configuration on ODU 0 computer as described in sec.2.8.7 to create an ARPA sensor. Enter the parameters specified in the paragraph below.

9.7.3 Parameters of ARPA Type Sensor

When an ARPA type sensor is added, the screen displays “ARPA” dialogue box where the following parameters should be entered:

- enter the identifier of the radar which the ARPA is connected to, in “Radar ID” spin box;
- enter the radar name in “Radar Name” text field;
- in “ARPA Type” drop-down list box select the format for ARPA output data:
  - select NMEA183 for BridgeMaster ARPA and RASCAR 3400 ARPA;
  - select ATLAS 8600 for ATLAS 8600 ARPA.
- in “Drop detection timeout” spin box enter the value of timeout for cancelling the target when no more data arrives from this target.

After the input of the aforementioned parameters press “Next>“command button: the screen will display “Connection” dialogue box where the following parameters should be entered:

- select the type of connection:
  - use “Local” radio button if the sensor is connected to ODU 0, or
  - use “Network” radio button if the sensor is connected to a remote computer.
- enter the COM port parameters for the local connection, or
- enter the IP address and IP socket number of the computer whose serial port the sensor is connected to for the network connection.

IP socket number must be coincident with that specified in the COMMUX program’s command line.

CHAPTER 10

Other VTS Systems

This chapter contains information on the adjustment of operation with other VTS Systems.

Copyright Transas Marine Ltd., 2003

10.1 CONNECTION AND ADJUSTMENT OF OPERATION WITH OTHER VTS SYSTEMS

The Navi-Harbour 1000/2000/3000 and Navi-Traffic VTS systems allow using another Navi-Harbour 1000/2000/3000 or Navi-Traffic VTS system as a source of target data. Information received from another VTS system is similar to ARPA information. To receive data from a remote VTS system, network connection via TCP/IP protocol.

To create Remote VTS type sensor, edit Sensor Configuration on ODU 0. Enter the parameters specified below:

- Sensor name in “Name” text box;
- IP address of the remote ODU 0/VTS Server in “IP Address” text box;
- For the number of IP port, enter 1234 value in “IP Socket” spin box.

CHAPTER 11

Hydro-Meteo Stations

This chapter contains useful information for handling Hydro-Meteo Stations.

Copyright Transas Marine Ltd., 2003

11.1 LIST OF COMPATIBLE HYDRO-METEO STATIONS

Navi-Harbour 1000/2000/3000 and Navi-Traffic systems enable operation with hydrometeorological station of PM2000 type.

11.2 DATA COMPONENTS

Depending on the set of sensors installed on the station, the following data may be available to the system user:

- Air temperature;
- Atmospheric pressure;
- Relative humidity;
- Wind speed;
- Wind direction;
- Water level.

11.3 VTS CONNECTION OPTIONS

Hydrometeorological station can be connected via a serial port to ODU 0 or any remote computer available via a modem of Ethernet.

If the hydrometeorological station is connected direct to ODU 0, no additional software components are required to be installed.

If the hydrometeorological station is connected to another VTS computer, the following components should be installed on it:

- Microsoft Windows 2000 OS (English or Russian version) Service Pack 2;
- Service COMMUX software (see sec.13.1 of this Manual);
- Network adapter(s) and appropriate drivers if communication with ODU 0 is via LAN;
- Remote access service if a modem will be used;
- TCP/IP protocol.

11.4 ADJUSTMENT OF ODU 0 FOR OPERATION WITH HYDRO-METEO STATION

Edit the configuration of sensors as detailed in sec.2.8.7 of this Manual to add PM2000 type sensor:

- enter the sensor name in “Hydro-meteo station name” field;
- in “Sensors” window, select sensor which are installed on the connected hydrometeorological station and whose data is expected to be used;
- select the type of connection used:
  - “Local” where the container is connected to ODU 0 and enter COM port parameters or
  - “Network” when the container is connected to a remote computer and enter IP Address and IP Socket of the computer which the sensor is connected to.

11.5 HYDRO-METEO STATIONS STATUS DIAGNOSTICS PANEL

The diagnostics panel enables the continuous monitoring of the Hydro-meteo station status in “Function” mode. To open this panel,

- select WINDOW\DIAGNOSTICS PANEL\HYDRO-METEO STATIONS if it is unchecked or
- select WINDOW\STATUS:HYDRO-METEO STATIONS. If there is no such item, press MORE WINDOWS and select Status:Hydro-Meteo Stations in the dialogue box which will appear.

The sensor status is displayed in the form of circles in different colours. The panel provides the following information.

Column	Data displayed	Status
Name	Hydro-Meteo station name	
Connection	Availability of connection	Green – there is connection Red – no connection or COM port error Transparent – in Standby and Demo modes
Data	Availability of correct data	Green – there is data Red – there is no correct data; Transparent – in Standby and Demo mode

The weather sensor data waiting time is 120 seconds. If the data has not arrived, an alarm about absence of data is generated, and a red lamp lights up in “Data” column.

Diagnostics of weather sensor status are shown in “System Status” window: the following elements of the status tree are used for this purpose*:* BY COMPONENTS\ ODU 0\HYDRO-METEO STATIONS\<NAME>\[DATA] [NETWORK CONNECTION] [SERIAL PORT].

CHAPTER 12

Network Planning

This chapter contains recommendations on network adjustment.

Copyright Transas Marine Ltd., 2003

12.1 GENERAL INFORMATION

The Navi-Harbour VTS is normally installed on several computers combined in a network.

The VTS network is that part of the user network which incorporates:

- sources of VTS information (e.g, radar processor);
- users of VTS information e.g, ODU or remote terminal);
- subnets used for the VTS data transit (if any).

A high data transmission rate between the VTS network computers is guaranteed if the computers are located in a single physical subnet (e.g, in a local Ethernet network). In the context of this chapter, we will use the term “subnet” to denote physical subnet.

ATTENTION!

If the VTS network consists of a single physical subnet, there is no need for the network planning, and you may omit this chapter.

The Navi-Harbour VTS computers can generally be located in different subnets. The subnets are connected with each other with slow links (e.g, fibre-optic lines or radio links). As considerable amounts of information may be passed from the sources to the users, it is necessary to optimise transfer of information via slow links, i.e, to prevent duplicate transmission of the same information via slow channels. (Duplicate data transmission is required where there is more than one user of the same information in the network). This problem can be solved by supplementing subnets with proxies for outgoing connections (proxies) – special programs participating in the process of data exchange throughout the VTS network.

The network planning involves several steps:

1. The decision about the necessity to introduce a proxy is made for each subnet (see sec.12.3.1).
2. If the proxy is required, a computer is selected which will accommodate it (see sec.12.3.2). If a special proxy program is used, installation and adjustment of this program are performed as described in sec.13.2.
3. The network configuration is set (see sec.12.4).
4. The correctness of routing is checked (see sec.12.5).

12.2 DATA STREAMS IN THE VTS NETWORK

The VTS network should be designed so that there is only one route for the data transfer from one subnet to another. This route may include a certain number of slow links and pass through other subnets.

Then, knowing the location of sources and users in the subnets, you can compile a wiring diagram required for the data transfer from the sources to the appropriate users. Such diagram will be obtained if you draw a line from each user of data to its source, in agreement with the available routes. The wiring diagram will help to take a decision on whether it is necessary to introduce proxies in the subnets.

It is, therefore, important to know which sources and users of data are available in the network. The two following paragraphs contain data on:

- which system components are users of which data types;
- which system components contain users (and how many) of each data type.

12.2.1 Sources of Information

The sources of information in the Navi-Harbour VTS are sensors. When plan-ning the network, it is necessary to pay attention to the sources of that information whose transmission creates a considerable load on the communication channel. These sources are listed in the table below:

Sensor	Program	Data type
Transas ORS-2	`ORSServ.exe`	• Video; • Targets (in a dual channel Transas ORS-2 sensor configuration)
Transas ORS-3	`ORSServ.exe`	• Video; • Targets
Transas Target Manager	`NaviHarb.exe` (ODU 0)	• Targets

It can be seen from the table that one and the same program can serve as the source of several data types. In what follows, the data source will imply the source of a certain data type. It can therefore, be considered that a single program contains several data sources.

12.2.2 Users of Information

One and the same program can contain several users of data (even of the same type and from one and the same sensor!).

The table below lists all the users of information which should be taken into account during the setting of the network configuration:

Name	Data used	Notes
ODU (any)	• Video; • Targets (in a dual channel Transas ORS-2 sensor configuration) or video (another one – in a single link Transas ORS-2 sensor configuration)	There is such user for each Transas ORS-2 and Transas ORS-3 sensor (if the display of video and targets is ON)
ODU 0	• Data listed above for the “ODU (any)”;	
	• Targets (in a dual channel Transas ORS-2 sensor configuration) or video (another one – in a single link Transas ORS-2 sensor configuration)	Used for tracking. There is such user for each Transas ORS-2 and Transas ORS-3 sensor
	• Video and targets	If the recording of appropriate tracks is ON (recording of targets in a single link Transas ORS-2 configuration is impossible)
Remote terminal	• Video; • Targets (in a dual channel Transas ORS-2 sensor configuration) or video (another one – in a single link Transas ORS-2 sensor configuration)	For each Transas ORS-2 and Transas ORS-3 sensor (if the display of video and targets is ON)
	• Video and targets	If the recording of appropriate tracks is ON (recording of targets in a single link Transas ORS-2 configuration is impossible)

12.3 USE OF PROXIES FOR OUTGOING CONNECTIONS

A proxy is a special software component implemented both, as a stand-alone program (`NHProxy.exe`), and in the form of a component built in the programs of ODU 0 and the Remote terminal.

The proxy is connected to the source of data or the next proxy on the way to the data source, receives data from it and then transmits it to all the connected users of this information or other proxies.

The use of proxies allows the data transfer to be optimised, as it eliminates the necessity of a direct connection of each user to the source and, therefore, the necessity of duplicate transmission of the same data via slow links.

12.3.1 Necessity to Introduce a Proxy in a Subnet

For each subnet determine if it is necessary to introduce a proxy in it or not. To do this, analyse the wiring diagram: if more than one path goes out of the subnet to a single source of data (including paths which use the subnet for transit), there should be a proxy in this subnet.

12.3.2 Selection of a Computer

As far as the selection of a computer for the proxy is concerned, if there is ODU 0 or a Remote Terminal (RT) in a subnet, it is necessary to use a proxy built into the ODU 0 or RT, otherwise, install a stand-alone proxy program in one of the subnet computers (see sec.13.2).

Note: The RT can be used as a proxy for the data from those sources which are included in its sensor configuration and only for those sources and users whose addresses are within the range of the RT network addresses configuration. Otherwise, a stand-alone proxy program should be used.

ATTENTION!

Not more than one proxy program can be run in a single subnet.

12.3.3 Data Transfer Diagram

With the correct setting of the VTS network configuration (in accordance with information contained in this Chapter of the Manual) the data transmission is implemented as follows: the user analyses the path to the source and tries to connect to the first proxy on this path, or directly to the source if there are no set intermediaries on the path.

12.4 NETWORK CONFIGURATION

The network configuration is a global characteristic of the Navi-Harbour VTS. To set the network configuration means to specify all the subnets included in the VTS network and to describe their properties.

Any subnet has the following properties:

- name;
- address and mask set in the decimal presentation with points;
- availability or absence of the proxy in the subnet (see sec.12.3.1);
- list of immediate neighbours, i.e, subnets which the given subnet has a direct connection with.

Note: A computer belongs to the subnet if its address combined with the subnet mask by the logical and operation produces the subnet address.

12.4.1 Editing of the Network Configuration

Editing of the network configuration is accessible via ADMINISTRATOR\NETWORK CONFIGURATION menu. This operation is qualified as a privilege operation which requires an appropriate access level to be performed (see sec.2.8.5).

Open “Network Configuration” dialogue window by selecting ADMINISTRATOR\NETWORK CONFIGURATION menu item:

- to add a new subnet, press “Add subnet…” button: the screen displays “General” dialogue window for the input of properties;
  - use “Subnet Name” text box to enter the name which you have given to this subnet;
  - in “Subnet Address Range” section enter the address and mask of the subnet in a dot decimal notation;
  - if there is a proxy in this subnet, state this fact in “Subnet Proxy” section by checking “Subnet has IS” checkbox and enter the following values:

    IP address of the computer on which the proxy program is run: in “IS Address” text box;
    port number (it is advisable to use the default number 2000): in “IS Port” text box.
  - press “Next”: the screen displays “Connections” dialogue window where you will select from the list names of the already set subnets which have a direct connection with the given subnet;
- to change properties of a certain network, press “Subnet Properties…” button: the screen displays “Subnet Properties” dialogue window;
- to delete a certain subnet, select its name from the list of subnets and press “Delete Subnet” button;
- to close “Network Configuration” dialogue window saving changes made in the configuration, press “OK” button;
- to close “Network Configuration” dialogue window without saving the changes, press “Cancel” button.

12.5 CHECK OF THE ROUTING CORRECTNESS

12.5.1 Checks for Users

For each user of information it is necessary to check if its connection for data to the proxy or directly to the source is in agreement with the network structure and data transfer schedule in use.

ATTENTION!

For the check of correctness of the user connection, ODU 0 program should be run.

Let us consider such check illustrating it by the example of a user of targets for display. First of all, turn on the display of targets in order to create such user (check appropriate checkboxes on “Targets” tab of “Radar Image” dialogue window):

Note: Please be reminded that the sources of targets can be represented by Transas ORS-2, Transas ORS-3 and Transas Target Manager sensors. Let us assume that Name is the sensor name and the user is in ODU N program.

- open System Status window in the user program (via WINDOW\SYSTEM STATUS menu item), select the display by components;
- select ODU N\RADARS(TARGETS)\NAME(TRANSAS ORS)\PLOT DATA\NETWORK CONNECTION status tree element (this element corresponds to the target user of the Transas ORS-2 sensor);
- analyse the value of Address item:
  - if this value has a 10.0.4.28:3002 type format, this means that the user connects directly to the source of information;
  - if this value has a “MUX: 10.0.4.28:3002” at 10.0.4.28:2000 type format, this means that the user connects to the proxy at 10.0.4.28:2000 address for the data from the source at 10.0.4.28:3002 address.
- ascertain that such connection is in agreement with the network structure and data transfer schedule detailed in sec.12.3.3, if not, edit the network configuration;
- perform a similar procedure for the rest of the sensors by selecting their corresponding elements from the status tree:
  - corresponding to the targets of Transas ORS-3 sensors are ODU N\RADARS(TARGETS)\NAME(TRANSAS ORS-3)\PLOT DATA\NETWORK CONNECTION status tree elements;
  - corresponding to the targets of Transas Target Manager sensor is ODU N\RADARS (TARGETS)\TARGET MANAGER(TRANSAS TARGET MANAGER)\PLOT DATA\NETWORK CONNECTION element.

12.5.2 Checks for the Proxies

For each proxy of the VTS network (including proxy built into ODU 0) it is necessary to check that its connection for data to the next proxy or directly to the source is in agreement with the network structure and the data transfer schedule in use.

ATTENTION!

For the check of correctness of the proxy connection, ODU 0 program should be run.

Use the following procedure:

- open System Status window in the proxy program (by using WINDOW\SYSTEM STATUS menu*)*, select the display by components;
- select the element corresponding to the data channel which is being checked from the status tree (see the table below).

Status tree element	Data channel
Sensor Proxies\Name (Transas ORS-2)\Radar Name (Plots) Multiplexer	Targets of Transas ORS-2 sensor (in case of dual channel Transas ORS-2 sensor configuration)
Sensor Proxies\Name (Transas ORS-3)\Radar Name (Targets) Multiplexer	Targets of Transas ORS-3 sensor
Sensor Proxies\Target Manager (Transas Target Manager)\Target Manager (Targets) Multiplexer	Targets of Transas Target Manager sensor

- analyse the value of Address item as described in the previous paragraph;
- ascertain that the connection of the proxy is in agreement with the data transfer schedule detailed in sec.12.3.3; if not, edit the network configuration.

12.6 PROXY CONNECTION DIAGNOSTICS

Any proxy does not create a channel for connection to the data source (or the first proxy on the path to the source) until the first user is connected to it.

The proxy connection diagnostics are shown in the System Status window, where corresponding to each proxy is a status tree element. For the diagnostics of the proxy connection, State and Error items of this element are used.

The table below lists the names of the status tree elements and their corresponding data types:

Status tree element	Data type
Sensor Proxies\Name (Transas ORS-2)\Radar Name (Video) Multiplexer	Video data of Transas ORS-2 sensor
Sensor Proxies\Name (Transas ORS-2)\Radar Name (Plots) Multiplexer	Targets of Transas ORS-2 sensor (in case of a dual channel configuration)
Sensor Proxies\Name (Transas ORS-3)\Radar Name (Targets) Multiplexer	Targets of Transas ORS-3 sensor
Sensor Proxies\Name (Transas ORS-3)\Radar Name (Video) Multiplexer	Video data of Transas ORS-3 sensor
Sensor Proxies\Target Manager (Transas Target Manager)\Target Manager (Targets) Multiplexer	Targets of Transas Target Manager sensor

Select the required status tree element and analyse the values of State and Error items:

1. State: “Connecting to <address>“ (where <address> address format is similar to that described in sec.12.5.1) means that the proxy is establishing a connection. If, as this occurs, Error item describes a description of an error, this means that during the attempt to establish a connection, a problem has arisen at <address> address.

Note: State item shows the status of that proxy on the path to the source, which is currently establishing the connection. Therefore, if there are any connection problems, <address> address in State item specifies the closest to the user proxy, which the connection cannot be established with.

2. State: “Connected to <address>“ and there is no error in Error item, this means that there are no connection problems on the entire path from the user to the source.

CHAPTER 13

Service Navi-Harbour Software

This chapter contains information on service software used in Navi-Harbour system operation.

Copyright Transas Marine Ltd., 2003

13.1 COMMUX PROGRAM

13.1.1 Purpose

COMMUX service program is intended for integrating into the system of sensors operating via the serial port and connected to the VTS computer remote from ODU 0. In this case, the remote computer should be accessible for ODU 0 via TCP/IP protocol (LAN or modem).

The following components should be installed on the computer whose serial port the remote sensor is connected to:

- Microsoft Windows 2000 OS (English/US version) Service Pack 2;
- ODU software.

Note: For the given ODU software installation, there is no need to have a dongle. When requested to insert a license diskette, use any ODU license.

- Network adapter(s) if the computer has these adapters;
- Remote access service if the modem is going to be used;
- TCP/IP protocol.

Check TCP/IP connection between this computer and ODU 0 as described in sec.2.4.3 of this Manual.

13.1.2 COMMUX Program Installation

To install COMMUX program, use the following procedure:

1. Install ODU software and restart the computer;
2. Find `Commux.exe` program in the folder where ODU software is installed;
3. Create a desktop shortcut for this program;
4. Edit this shortcut parameters as per the next paragraph;
5. Copy the configured shortcut to “Startup” folder.

13.1.3 Commux Program Adjustment

The program `COMMUX.exe` is used for the connection to remote sensors (except ORS). Working with remote sensors is impossible without this program. COMMUX accepts the following parameters:

Parameter types	Description	Default values
/w<write mode>	0 – writing to com port is disabled; 1 – writing to selected client; 2 – writing to all clients	0
/c<com number>	Serial port which a sensor is connected to.	2
/m<com port mode>	<baud rate>,<parity>,<bits per byte>, <stop bits>	4800,N,8,1
/s<socket number>	IP socket number not conflicting with other socket numbers used on this computer	4000

If some of the parameters are omitted the program uses their default values.

For all types of sensors typical mode parameters are N, 8, 1. Usual baud rates for some types of sensors are the following:

Sensor type	<Baud rate> value
ARPA Bridgemaster	4800
DF ARCUS M	9600

Below is an example of a command line:

COMMUX/w2/c1/m 9600,N,8,1

- write mode – writing to all clients;
- COM port – 1;
- com port mode: 9600,N,8,1;
- IP Socket – 4000.

13.1.4 Adding Commux Program to the Startup Menu

To avoid manual starting of COMMUX program add it to the Startup menu providing the required parameters. Then it will be run automatically at each system's login.

To add COMMUX program to the Startup menu use the procedure described in sec.2.5.6. Ascertain that the command line of "Create shortcut" dialogue box contains the parameters required for this sensor type.

If necessary to run this program immediately do it manually from START\PROGRAMS\STARTUP menu.

13.2 STAND-ALONE PROXY PROGRAM

13.2.1 Preparatory Operations

The computer selected for the installation of the proxy software is required to be operating under Microsoft Windows 200 English/US version, Service Pack 2. For the preparatory procedures see sec.2.4 of this manual.

13.2.2 Program Installation

To install `NHProxy.exe` proxy program on the selected VTS network computer, use Navi-Harbour license disk and install Navi-Harbour software on this computer if it has not yet been installed (use the procedure detailed in sec.2.5.3 of this manual).

Remember the IP address of the computer on which the proxy program is installed: this address is a subnet property and should be specified in “Network Configuration” dialogue window (see sec.12.4.1).

Note: With this kind of the Navi-Harbour software installation, no activator is required. If requested to insert a license diskette, use ODU 0 license.

13.2.3 Program Adjustment

Before using the proxy program, perform the procedure detailed below:

1. Open `routing.ini` file, in [Remote] section delete the comment symbol (“;”) and replace 127.0.0.1 address with the IP address of that computer where the ODU 0 is run.
2. Add `NHProxy.exe` program to the Startup menu by using the procedure described for an ODU in sec.2.5.6 (If this program is required to be run immediately, do this manually from START\PROGRAMS\STARTUP menu).

Note: It is allowed to use concurrently the program of the proxy and ODU N program (where N is not equal to zero). In this case, adjustment of `routing.ini` file is performed once for both programs.

13.2.4 Diagnostic Panels

The diagnostics panels are used for displaying the diagnostics of the proxy connection with other system components. There are two diagnostics panels “Status: Radars” and “Status: Main Units”. “Main Units” panel shows the availability of connection with the VTS server and Target Manager sensor.

The red lamp in “Connection” column means that there is no network connection with the corresponding sensor, the green lamp means that there is network connection.

To open the panel:

- select WINDOW\DIAGNOSTICS PANEL\[RADARS][MAIN UNITS] if it is unchecked or
- select WINDOW\STATUS:[RADARS][MAIN UNITS].

13.3 RADAR MAINTENANCE MONITOR PROGRAM

13.3.1 Introduction

The Radar Maintenance Monitor (MM) is a special component included in the ORS software. The program is installed automatically in the folder, which has been selected for the ORS software. The MM installation and operation require no licensing. The MM provides the following capabilities available in the ODU:

- control of ORS radar sensor:
  - control of the radar;
  - selection of a set of parameters and radar processor thresholds;
  - switching of the ORS operating mode;
  - display of the initiative targets (extractor marks in case of the ORS-2).
- display of the radar image on the ORS computer screen with a simultaneous transmission of the radar image and initiative targets (extractor marks) data to the control centre;
- in addition, the MM enables both, independent and joint operation with the control centre.

13.3.2 Running Maintenance Monitor

To run the Maintenance Monitor program, select START\PROGRAMS\ORS\MAINTENANCE MONITOR menu item.

13.3.3 Configuring Maintenance Monitor

The program window consists of the heading, Main menu, a toolbar, an Area window with geographical grid and Status bar.

Toolbar Display

To turn on/off the display of the toolbar, check/uncheck WINDOW\TOOLBARS\AREA OPERATION menu item.

Status Bar

The Status bas is located in the bottom part of the program window and displays the following information:

- tips (description of toolbar buttons and menu items, which the cursor is pointing to);
- current scale of the Area window;
- bearing of the Area window with regard to the direction to the North.

The display of the Status bar can be turned on/off: check/uncheck WINDOW\STATUS BAR.

To Return to the Initial Area

Initial state of the Area window implies the scale of the window is 1:250 000 and the window centre is located at the point of radar location. At any moment it is possible to quickly return to the Initial area, using one of the following procedures:

- press the toolbar button

or
- select AREA\INITIAL AREA menu item.

To Return to the Previous Display Area

To return to the previous state of the display area, use one of the following procedures:

- press the toolbar button or

- select AREA\PREVIOUS AREA.

Control of Initiative Targets Display

To turn on/off the display of initiative targets (extractor plots) in the Area window, check/uncheck RADAR\TARGETS menu item.

Note: Initiative targets (in case of ORS-3 sensor) are displayed along with target vector, which length is equal to 1 min by default. To change this length, edit the variable VectorLen=#, where # – number of minutes from the range 1…30 in [View] section of configuration file `_default.cfg`.

13.3.4 Configuration File Editing

In the configuration file, which has `_default.cfg` for the default name and is stored in `NHRdMon.cfg` folder, specify the type of the radar processor you are using and edit the radar coordinates. To edit the configuration file, exit from the Maintenance Monitor program (by pressing <Ctrl> + <F4> keys or “Close” button in the right hand part of the MM program heading).

At the time of delivery, the radar is in the centre of the Area Window in a point with (0,0) coordinates.

Find [Radar] line and edit values of RadarLatitude and RadarLongitude variables by specifying the actual coordinates of the radar you are using in the following format: Degrees Minutes Seconds [N|S|E|W]. The last component of the radar coordinates may have a decimal point and digits after it.

For example:

- RadarLatitude=60 00 00.0 N;
- RadarLongitude=030 00 00.0 E.

Note: Once the radar coordinates in configuration file were changed during the next run of MM use “1:1” button to quickly return to the display area with the centre at radar location.

The radar processor type is described by RadarType variable of [Radar] section. One of the following values should be set: ORS for ORS-2 or ORS3 for ORS-3, e.g.

RadarType=ORS3.

13.3.5 Control of the Radar and Radar Processor

The control panel enables the control of:

- radar;
- radar processor.

To control the radar processor use the following procedure:

- select RADAR\CONTROL menu item;
- In “Radars” dialogue box press “Control” button (if it has not yet been pressed) in order to switch to the control mode.

Note: If at this moment one of the ODU’s happens to be in the radar processor control mode, the following inquiry is displayed on the screen: “The sensor control will be switched to the Service Monitor. Are you sure?”. If the answer is yes, this ODU will be disconnected from the control mode.

Checking of ORS-2 Radar Processor’s Fitness for Operation

- Switch to “Radar processor” tab;
- Press “Test” button of “ORS mode” section to start the testing program;
- The Chart window should display the radar picture.

Switching of the ORS Operating Mode

Switch to “Radar processor” tab and use buttons of “ORS mode” section:

- to start the radar processor press “Run” button;
- to stop the radar processor press “Standby” button.

Selection of the Parameter Set

- Switch to “Radar processor” tab and use the list displayed in “Control Set” section to select the required set of parameters;
- Press “Auto” button to turn on the option for the automatic change of the parameter set with the change of the pulse length.

Adjustment of the Radar Processing Thresholds

- Switch to “Settings” tab and use the slide boxes in “Signal Processing” section to select the required values of Rain, Sea and Gain parameters;
- Press “Auto Gain” button to turn on the automatic signal gain option.

To control the radar use the following procedure:

- switch to “Radar” tab of “Radars” dialogue window;
- to control the switchable radar, use buttons of “Set active” section if you wish to select the active radar;
- in “Pulse length” section set the length of the transmitted pulse by selecting the appropriate radio button.

ATTENTION!

If an option for the automatic change of parameters with the change of the pulse length is not enabled on “Radar processor” tab of the ORS sensor control panel, the operation of changing the Radar Processor parameter set should be performed with each change of the radar pulse length.

- to switch the radar’s operating mode, use “Power OFF”, “Standby” and “Transmit” buttons.

13.3.6 Control of the Radar Image Display

The radar image cannot be displayed in the Area Window unless the Radar Processor is operating.

To turn off the radar image display, select RADAR\DISCONNECT menu item.

To turn on the radar image display, select RADAR\CONNECT menu item.

13.3.7 Joint Operation with the Control Centre

The Maintenance Monitor allows joint operation with the Control Centre. In this case, the control mode can be turned on either on the MM or on one of the ODU computers. At the time when the radar processor control is effected from the MM, the relevant buttons on the ODU are disabled. To switch off the control mode on the MM, press “Master” button again.

“Master” button on the MM is always enabled, and the pressing on this button causes the control to be passed on to the MM program. If at this moment one of the ODU’s is in the radar processor control mode, you should confirm the passing of the control by replying to the following inquiry: “Sensor control will be switched to the Maintenance Monitor. Are you sure?”

13.3.8 Problems which May Occur During the MM Start

No Radar Image

Cause: Sensor type may have been set incorrectly.

Recommended procedure: Edit the configuration file by entering the radar processor type you are using.

Initiative Targets are not Displayed

Cause: Coordinates of the radar in use are set incorrectly.

Recommended procedure: Edit the configuration file by entering the coordinates of the radar in use.

CHAPTER 14

VTS Remote Terminal

This chapter contains necessary information for handling the Remote terminal.

Copyright Transas Marine Ltd., 2003

14.1 GENERAL INFORMATION

VTS Remote Terminal is a stand-alone product with its own license whose distribution set is stored on the Navi-Harbour license disk. The Remote Terminal is connected to the Navi-Harbour central component (via WAN or by using the modem and remote access service) and receives the following on-line data on all the ships:

- data on positions and motion parameters;
- identification data.

This data is used for building up the targets table of the Remote Terminal.

The following sensors are provided in the sensor system of the Remote Terminal:

- Transas ORS-2, Transas ORS-3 – counterparts of Navi-Harbour ORS-2 and ORS-3 sensors, but in this case they provide the display of the radar picture only (without initiative targets);
- Target Manager (which provides the display of initiative targets);
- Remote VTS (Navi-Harbour Main component).

The set of sensors of the Remote Terminal is required to correspond to the set of sensors of the Navi-Harbour VTS. Moreover, the corresponding sensors should have identical names.

If the Transas ORS-2 is used, the configuration of channels (single- or dual-channel) is required to correspond to the configuration of Transas ORS-2 sensor channels in the Navi-Harbour. Similarly, configuration of Transas ORS-3 sensor (Single or Duplicated) is required to correspond to the configuration of Transas ORS-3 sensor in the Navi-Harbour.

The Remote Terminal is always single-console.

14.2 DONGLE INSTALLATION

To connect the dongle, it is necessary to turn the computer off, connect the dongle to the parallel computer port and turn the computer on.

14.3 REMOTE TERMINAL SOFTWARE INSTALLATION

14.3.1 Running Setup Program

Insert the Navi-Harbour installation CD into the CD-ROM drive; open the folder *NH_RT_ENG\disk01* and run `Setup.exe` program: the screen will display “Welcome” dialogue box.

14.3.2 Working with Setup Program

Target Directory Selection

The folder for the installation of Remote terminal software can be selected in “Select Target Directory” dialogue box. Confirm the suggested path (in this case the program will be installed into *C:\NH_RT37* folder) or enter different path.

License Installation

When prompted insert the license diskette into the FDD or specify the path for the copy of license diskette and press “OK” command button: the screen will display “License Information” dialogue box, which contains license information:

- make sure the Registration number (number of the license) is correct;
- make sure the Dongle number match the number of the supplied dongle.

Note: “Expiration date” field contains no expiration date for legally purchased products. For demo versions this field contains some date.

Program Manager Group Selection

When prompted to Select Program Manager Group confirm the suggested name or enter the name of your own.

Computer Restart

After the successful installation the question “Do you want to restart your computer?” appears on the screen. Answer “Yes” to re-start the computer.

14.4 PLAYBACK OF THE RECORDED INFORMATION

The Playback ODU of the Remote Terminal allows the playback of tracks recorded by the Remote Terminal program. When working with the Playback ODU, use the procedures detailed in **Work with Playback ODU of the Remote Terminal** chapter of the **REMOTE TERMINAL USER MANUAL**.

CHAPTER 15

Troubleshooting

This chapter contains description of the most frequently occurring problems and recommendations to avoid them.

Copyright Transas Marine Ltd., 2003

No Radar image can be seen in the Chart window.

Cause	Recommendation
Sensor configuration does not contain this radar sensor	Add the radar sensor to Sensor configuration
VTS chart contains no “Radar” type object or its ID does not match to that in the Sensor configuration	Add “Radar” type object to the VTS chart. Make sure to provide correct ID number
The selected radar (in “Radar Image” dialogue box) differs from the required one	Select the radar properly
The given radar visibility zone does not comprise the current chart area	Change current chart area to suit this radar visibility zone
No network connection to Radar processor	Consult your network administrator to eliminate network problems
VTS system operates in mode other than Function	Switch the system to Function operation mode
Radar processor operates in mode other than “Run”	Switch the Radar processor to Run operation mode
Video signal cables and/or trigger are improperly attached to the radar processor (in this case a corresponding message appears in “Messages” panel; also the controls in “Radar Processor” tab of “Radars” dialogue box are disabled)	Connect the cables properly
Rain, Sea, and Gain parameters of the Radar processor have unreasonable values	Set the mentioned parameters properly, make sure Output rate in “Statistics” tab of “Radars” dialogue box contains a non-zero value

You have altered properties of a VTS chart or sensor chart objects, but the properties have remained unchanged.

Cause	Recommendation
Changes have not been saved to the disk	Press “Save” toolbar button

No targets tracked.

Cause	Recommendation
Corresponding sensor is not created	Add the required sensor to Sensor configuration
VTS system operates in mode other than Function	Switch the system to Function operation mode
No network connection with the sensor	Consult your network administrator to eliminate network problems

Direction finder’s beam can not be seen.

Cause	Recommendation
Corresponding sensor is not created	Add the required sensor to Sensor configuration
VTS chart contains no object of appropriate type	Create “Direction finder antennae” VTS object
No network connection to the remote sensor	Consult your network administrator to eliminate network problems
Transmission channel in use does not match to that set in Channel configuration (“Display” tab of “DF ID Control” dialogue box)	Change Channel configuration to match the used channel

Unexpected target drop during the ORS-2 operation.

Cause	Recommendation
The target has passed a shadow from another target	Increase the number of skips before the dropping

In case of synchronous playback of audio exchange recording data (with the use of the “Olha” board) there is noise and interference instead of signals.

Cause	Recommendation
Format for the board is set incorrectly	In "Hardware Channel Properties” dialogue window set the following format: 8,000 kHz; 16 Bit; Mono

In case of synchronous playback of audio exchange recording data (with the use of the “Olha” board) there are some brief pauses in the playback or sound beating at the beginning of the recording.

Cause	Recommendation
There is unstable transmission via the network	Try to eliminate this problem by changing Block Time parameter of "Hardware Channel Properties” dialogue window to increase it

During the passing of a target from the responsibility area of one ODU to the responsibility area of another ODU, it is impossible to participate in the process of passing the responsibility: the decision is taken by the system automatically.

Cause	Recommendation
The time meter in “Parameters for Targets” dialogue window, which determines the system’s time of waiting for the operator response, has too small a value	Increase the meter’s “Over” value on “Responsibility” tab of “Parameters for Targets” dialogue window

Operator N is unable to get registered and go on the watch.

Cause	Recommendation
Operator N is not on the list of Operators	Add operator N to the list of operators
Operator N enters an incorrect password	Edit the list of operators by changing the password of operator N

Database Log Book is not kept.

Cause	Recommendation
The keeping of the log book is disabled in `NharbN.ini` file	Enable the keeping of the log book by editing [Config] section of `NharbN.ini` file
The current ODU operator is not attached to the database	Perform the “Watch relieve” operation, having selected an operator attached to the database

“VTS Server – no network connection” alarm is generated on ODU N.

Cause	Recommendation
ODU 0 has not been started	Start ODU 0
No connection with ODU 0 computer	Contact the network administrator for the reestablishment of the network connection
`Routing.ini` on ODU N is incorrectly adjusted	Edit `routing.ini` file: specify the correct IP address of the computer where the ODU 0 is operating
None of the aforementioned operations has eliminated the problem	Re-start ODU 0 computer, then re-run ODU 0 program

ANNEX 1

Work with Chart Manager Program

Copyright Transas Marine Ltd., 2003

Chart Manager program is intended for the converting of open or closed S57 charts in the initial `*.000` format, to the protected format `*.cd8` used for the display of S57 charts on the Navi-Harbour system ODU's.

Chart Manager program is installed on each ODU of the system.

CHART MANAGER PROGRAM INSTALLATION

To install Chart Manager program, use Navi-Harbour distribution CD:

- copy the contents of Chart Manager folder to the selected hard disk folder, e.g, Chart Manager folder;
- copy `license.dat` file out of ODU N license files into the same folder.

ATTENTION!

`License.dat` file is required to belong to the license for the current ODU N program version.

Use of Chart Manager Program

1. Run `cm.exe` program: Chart Manager program window is displayed.
2. Switch to "Table" tab.
3. Press "Format" button and select S57(SENC) line from the drop-down menu.
4. Select CHART\OPEN menu: the screen will display a standard file opening dialogue window:
   - select the S57 format chart source file (of `*.000` type) and press "Open" button;
   - the selected chart appears in "S57External Collection from <path>" table.
5. Press "Install" button: "Summary information" dialogue window with information on this chart is displayed.
   - Check that Result column contains Installed line. This means that the chart has been successfully converted to `*.cd8`, and the resulting file has been placed in *Chart Manager\DXChart* folder;
6. Copy the converted S57 chart from *Chart Manager\DXChart* folder to the folder intended for the storage of the above mentioned format charts.

ANNEX 2

Contacting TRANSAS

Copyright Transas Marine Ltd., 2003

United Kingdom:

TRANSAS MARINE Ltd.

Sea Hawk

Bilton Way

Off Airport Service Road

Portsmouth PO3 5JN

Phone: +44(0) 23 92 674000

Fax: +44(0) 23 92 674048

E-mail: sales@transas.co.uk

Russia:

TRANSAS SOFTWARE HOUSE

21/2 Obukhovskoy Oboroni, St.-Petersburg, 193019, Russia.

Тел: +7(812) 325 31 31

Fax: +7(812) 567 19 01

E-mail: sales@transas.com

USA:

TRANSAS (USA) INC

19105 36th Avenue West, Building 2 Suite 101, Lynnwood, WA 98036.

Phone: +1(425) 778 45 46

Fax: +1(425) 771 43 70

Email: toma@transasusa.com

Germany:

TRANSAS GmbH

Luruper Chaussee 125, 22761 Hamburg, Germany.

Phone: +49(40) 890 66 60

Fax: +49(40) 881 13 79

E-mail: info@transas.de, transas-gmbh@t-online.de